

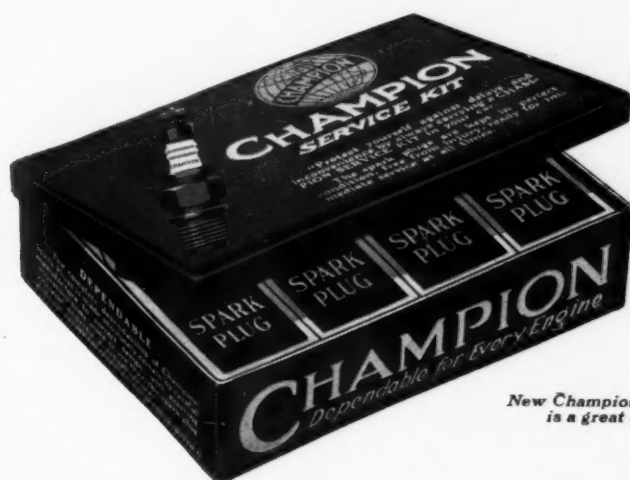
In This Issue—Why Not Sell Tires?

MOTOR AGE

Vol. XLIII
Number 21

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, MAY 24, 1923

Thirty-five Cents a Copy
Three Dollars a Year



New Champion Service Kit
is a great sales aid



Champion X is the recognized standard spark plug for Ford Cars and Trucks and Fordson Tractors. Recognized by dealers and owners for 10 years as the most economical and efficient spark plug. Sold by dealers everywhere.

Champion Lower Prices Make Dealers More Money

The lower list prices of Champion Spark Plugs actually make the dealers more money on their investment.

This is because motorists willingly pay the Champion list price and the dealer makes the entire sum to which he is entitled. Based on his investment he makes a greater percentage of profit. His turnover is faster because Champion is outselling as it deserves to outsell—because it is a better spark plug.

Champion Spark Plug Company, Toledo, Ohio
Champion Spark Plug Co. of Canada, Ltd., Windsor, Ontario

The Champion Blue-Box Line is Concentrated in Seven Numbers. Less Investment is Necessary to Carry Complete Stock

CHAMPION

Dependable for Every Engine

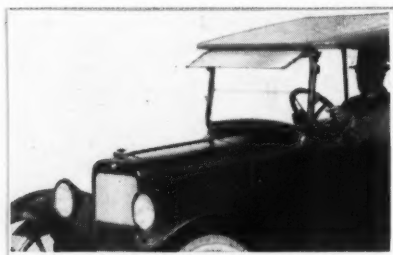
More Good News for Sunbeam Visor Dealers



The **SUNBEAM JUNIOR**
is now made for all models
of—

**OVERLAND
CHEVROLET
STAR and FORD**

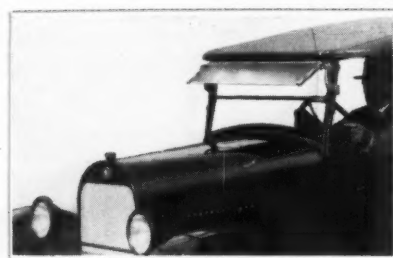
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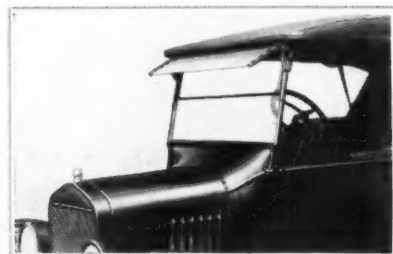
Overland



Chevrolet



Star



Ford

MORE Thoma Sunbeam Junior Visors have been installed on Ford cars than of all other visors combined—the only high-grade glass visor made for Ford cars.

You can now offer your customers the Sunbeam Junior for four popular low-priced cars, doubling and redoubling your profits on this high-grade, moderately priced accessory. Made of green or amber Thoma Process Ribbed Glass with pressed steel frame and sturdy malleable brackets. Retails for \$9. West of Rockies, \$10.

Quick turnover, and a handsome profit for you in every Sunbeam Junior you sell. Write for liberal dealer proposition.

Sunbeam "V" line, furnished in Vitrolite, Royal Purple, for the man who wants nothing short of perfection.

Sunbeam "G" line, equipped with green or amber ribbed glass, a visor for the popular priced car.

Prices on request on Sunbeam De Luxe line and Sunbeam Custom—built in silver and gold—the most complete line of visors built.

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by

THOMAS & SON-INC.
Everything in
Glass for the Automobile

Fairfield
Iowa

A "Salesman" That Works for Nothing



HERE'S a silent "salesman" that you can put in your store to sell Stewart Custombilt Accessories for you.

We call it the Stewart Theatre Display because it is designed like a stage. It can be set up on your counter or in the window in but a few seconds. Any Stewart Accessory—Speedometer, Horn, Searchlight, Mirror—can

be placed within the display without need of extra attachments.

The Stewart Theatre Display is made up in many beautiful colors, and will add much to the attractiveness of your store and to your profits.

If you haven't ordered one, better send in the attached coupon immediately, as our supply is limited.

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CHICAGO • U. S. A.

Stewart
CUSTOMBILT ACCESSORIES
USED ON 8 MILLION CARS

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Speedometer
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CHICAGO

Please send me, prepaid,
one Stewart Theatre Display

Name.....

Street.....

Town.....

State.....

Just What Burroughs is Doing in the Motor Industry



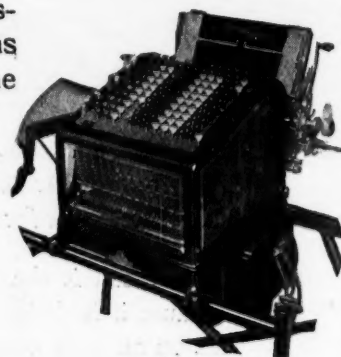
PHARAOH AND McKINLEY rode at the same slow pace—in chariot or in carriage. Then the motor age dawned, and transportation speeded up.

Naturally enough, everything connected with the *business* of transportation speeded up at the same time. The transportation world almost overnight became in a hurry.

The manufacturers required their figures in a hurry; the garage and repair men had to get out their accounts with speed; the car owner required his bills in a hurry. And above all, absolute accuracy was necessary.

Burroughs stepped in at this juncture and provided first the machines and then the Burroughs Simplified Accounting Plan for Garages, so as to give automotive retailers daily profit making figures in keeping with the speed of the industry.

From the automobile factory where stock records, pay rolls, distribution, etc., are prepared by Burroughs machines, to the garage man who sells the products of the motor industry and keeps his records with the Burroughs Simplified Accounting Plan, Burroughs is the **STANDARD** figuring equipment to give the greatest industry on the continent the right figures in the quickest time and at the least cost.



Better Figures
make
Bigger Profits

Burroughs

ADDING • BOOKKEEPING • BILLING • CALCULATING MACHINES

MOTOR AGE

Published Every Thursday by

THE CLASS JOURNAL COMPANY

MALLERS BUILDING

59 East Madison Street, CHICAGO

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Selling Them and Keeping Them Sold!

It is good salesmanship to "sell" a man, but good merchandising is keeping him "sold."

That is why we stress the superior service of Goodrich Tires and why it is natural for Goodrich Dealers to get orders for replacements and spares from the large number of car owners who found Goodrich their original equipment.

Our 1923 dealers' co-operative sales plans are interesting because they are so successful—they meet the needs of every dealer, large or small. That is one big reason why they build permanent business for you—the QUALITY is always there to back you up.

Ask us about them now.

THE B. F. GOODRICH RUBBER CO.
Established 1870

Goodrich

TIRES

"Best in the Long Run"





*To my son, Silas,
I bequeath my Brown Derby Timer*

"— it has served me faithful for 30 years and it has saved me a lot of money for I have not been in no auto supply store since I bought it."

So reads the last Will and Testament of one Hiram Titus. It is a neat Testimonial to the famous Brown Derby Timer, proving that it truly "Outlasts the Car" as modestly stated in its Advertisements.

The late lamented Hi Titus forgot to state that the Brown Derby also prevents Carbon, repairs Spark Plugs, takes Back-Lash out of the Differential and makes itself generally useful about the Car

— while the poor Milwaukee Timer is no cure-all at all, and doesn't pretend to last a life-time. It just improves the Ford's ignition, and builds up a Real, Repeat Business for the Dealer.

MILWAUKEE MOTOR PRODUCTS, Inc.
MILWAUKEE WISCONSIN

Remember — our national, motoring, and farm paper advertising is working for you all the time, keeping the Milwaukee Timer in demand at \$2.00.

Re-order Milwaukee when your Jobber's Salesman calls — or now, by mail.

**MILWAUKEE
TIMER for FORDS**

Sells Fast at \$2.00
(\$2.75 in Canada)



STUDEBAKER



An Advantage to Both Buyer and Seller

The fact that Studebaker builds a complete line of cars is a decided advantage to every Studebaker buyer—just as it is to every Studebaker dealer.

Here's why—

A customer, we'll say, buys a Light-Six. He likes it—everyone likes his Studebaker. He gets to know the men in the Studebaker organization and likes them. Calls 'em by their first names—feels safe in leaving matters to their judgment.

Sooner or later the customer wants a larger car—most every owner of a smaller car decides some day to own a bigger one. The Studebaker buyer doesn't have to go somewhere else to get it and get acquainted all over again. He selects a Special-Six, or a Big-Six, and deals with the same good friends.

With a complete line of sixes, the Studebaker dealer is able to make these customers permanent Studebaker customers—these customers bring in other customers who become permanent, and so on—sort of an endless chain.

When it comes to building a profitable business, there's nothing to compare with a good line of merchandise in a variety of the right styles, sizes and prices, and a volume of owners who are enthusiastic over the product and continue to buy it time and time again.

THE STUDEBAKER CORPORATION OF AMERICA
South Bend, Indiana

MODELS AND PRICES—f. o. b. factories

LIGHT-SIX 5-Pass., 112" W. B., 40 H. P.	SPECIAL-SIX 5-Pass., 119" W. B., 50 H. P.	BIG-SIX 7-Pass., 126" W. B., 60 H. P.
Touring.....\$975	Touring.....\$1275	Touring.....\$1750
Roadster (3-Pass.).....975	Roadster (2-Pass.).....1250	Speedster (5-Pass.).....1835
Coupe-Roadster (2-Pass.).....1225	Coupe (5-Pass.).....1975	Coupe (5-Pass.).....2550
Sedan.....1550	Sedan.....2050	Sedan.....2750

T H I S I S A S T U D E B A K E R Y E A R

Nash Leads the World in Motor Car Value

Read this Report from Great Falls

Three years ago George Buhler was operating a cafe in Williston, North Dakota.

But the automobile business won his interest and now he's the Nash dealer in Great Falls, Montana.

He's brimful of western aggressiveness and with the Nash line to back up his energy he has been building his business larger and larger.

From the first of the year to May 15th he has retailed 84 cars.

His aim, he says, is ultimately to be the biggest Nash dealer in Montana.

All over the country men are proving that the Nash contract is an avenue to money-making. And right now there are some fine Nash territories that can be had by men of the George Buhler stamp.

NASH

THE NASH MOTORS COMPANY
KENOSHA, WISCONSIN

Nash Leads the World in Motor Car Value

(1627)



MARMON

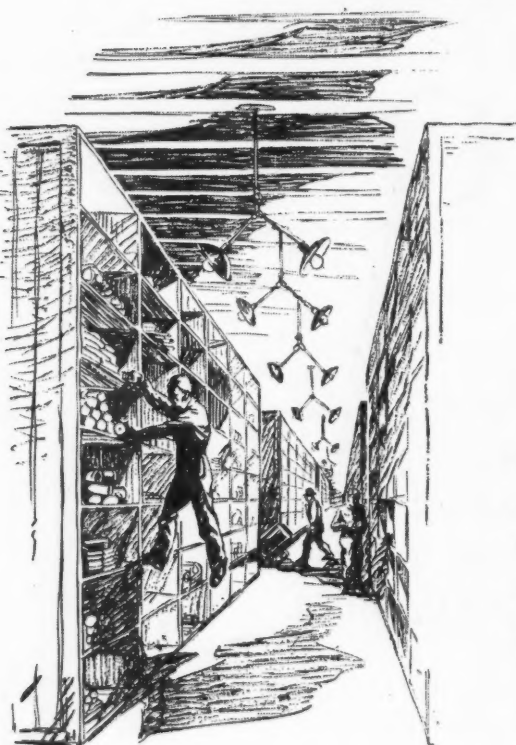
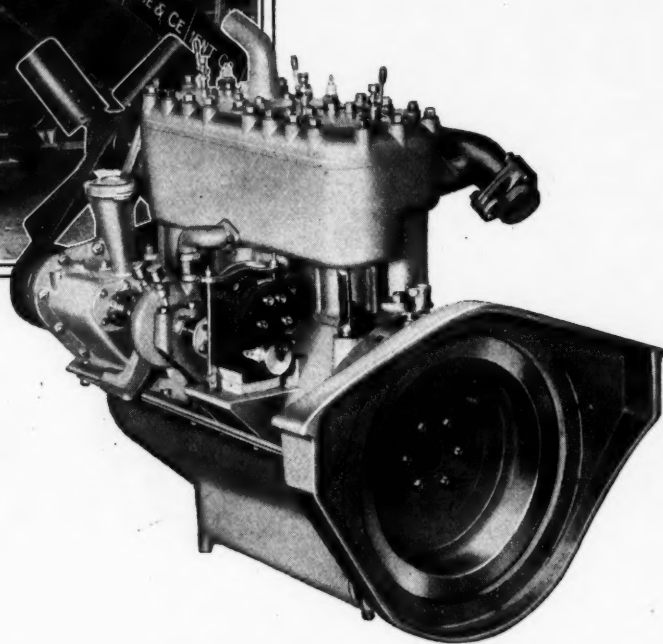
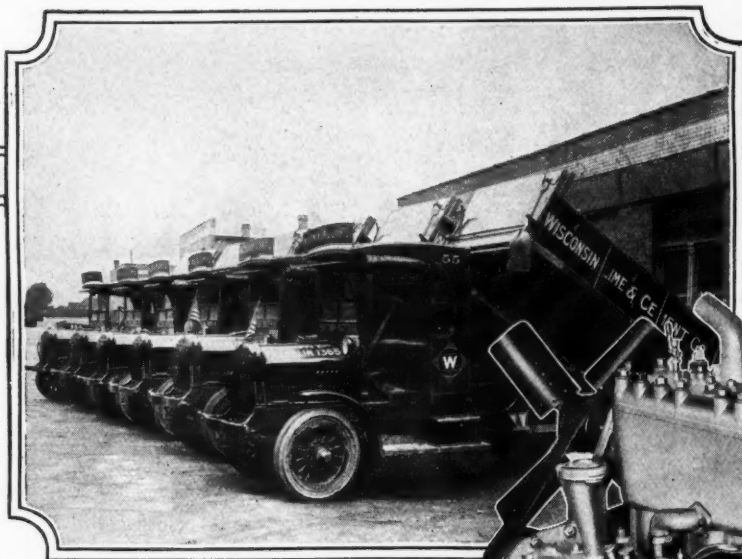
In seventy-two years of sound and orderly progress the Nordyke & Marmon Company has never built a better, more reliable product than the Marmon motor car of today. And never before has the Marmon been so eagerly chosen by the motor car investors of America.

NORDYKE & MARMON COMPANY

Established 1851 • INDIANAPOLIS

Address Inquiries to Dept. A





Offices in New York,
Cleveland, Chicago,
Los Angeles, Seattle

Organized Service

If you are able to render prompt and efficient service on the trucks you sell, it's easier for you to get orders.

That is why Wisconsin Organized Service wins the approval of dealers who handle Wisconsin Motored trucks.

Our service department always has the part you need in stock.

Fast transportation from factory or branch does the rest.

Wisconsin Motors are built of the best material by skilled workmen for economy and endurance—yet they cost no more.

Look for them when you consider a truck agency.

WISCONSIN MOTOR MFG. CO.

MILWAUKEE

WISCONSIN

Wisconsin
CONSISTENT

MOTOR AGE

Now Is the Time to Add Tires to Your Transportation Store

Manufacturers Are Creating Better Conditions to Attract a Better Class of Dealers. Divide Your Overhead and Assure Profits

By CLYDE JENNINGS

This Is the First of a Series of Articles on Tires

WE have already informed our readers that in this number of MOTOR AGE we would print the first of a series of articles on the subject of merchandising tires.

The reason for taking up the subject of tires for more extended treatment at this time is that we believe that this is the time and the place for such a discussion. We believe, after a considerable investigation, that the time is ripe for a change for the better, in tire merchandising.

Tire merchandising has passed through its period of degradation and is very rapidly taking its place as a prosperity builder for those who sell tires.

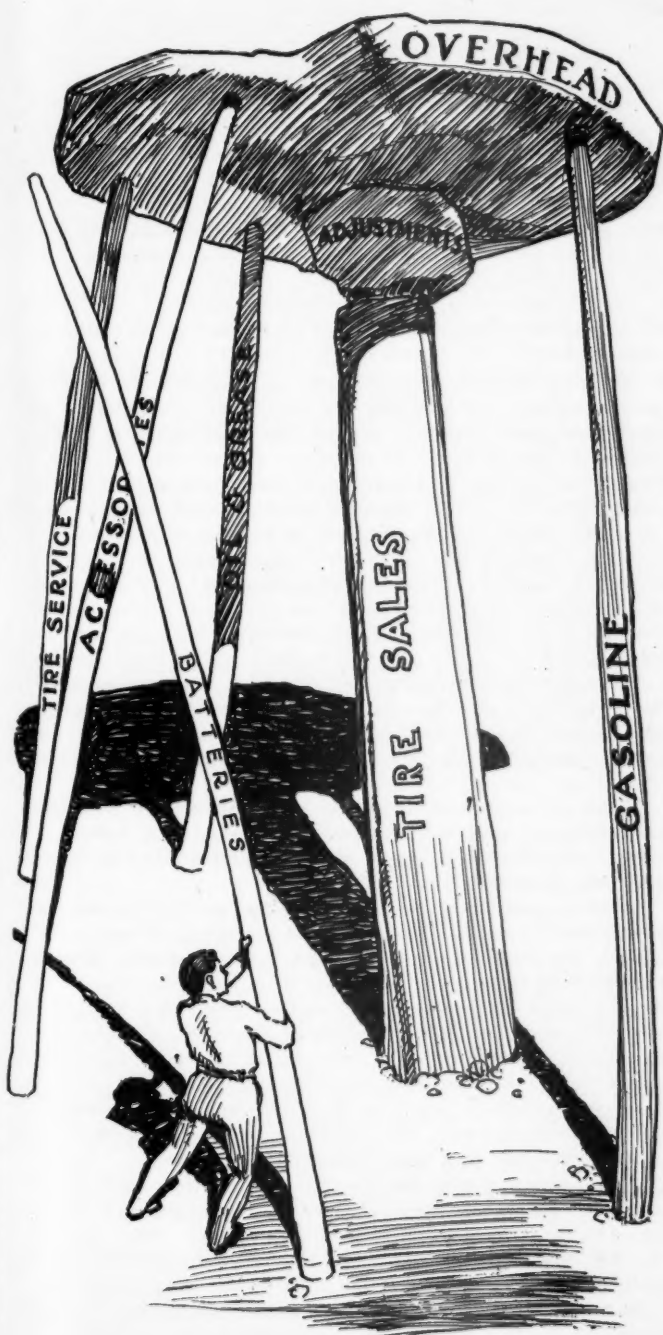
Many betterments have contributed to this change that is so rapidly going forward. Chief among these betterments was the complete collapse of the extravagant, exclusive dealer organization that had been built up in the time of prosperity and high prices. Dozens of tire companies went to the wall during that collapse and scores of others escaped bumping the wall by grace of the bankers' and creditor committees.

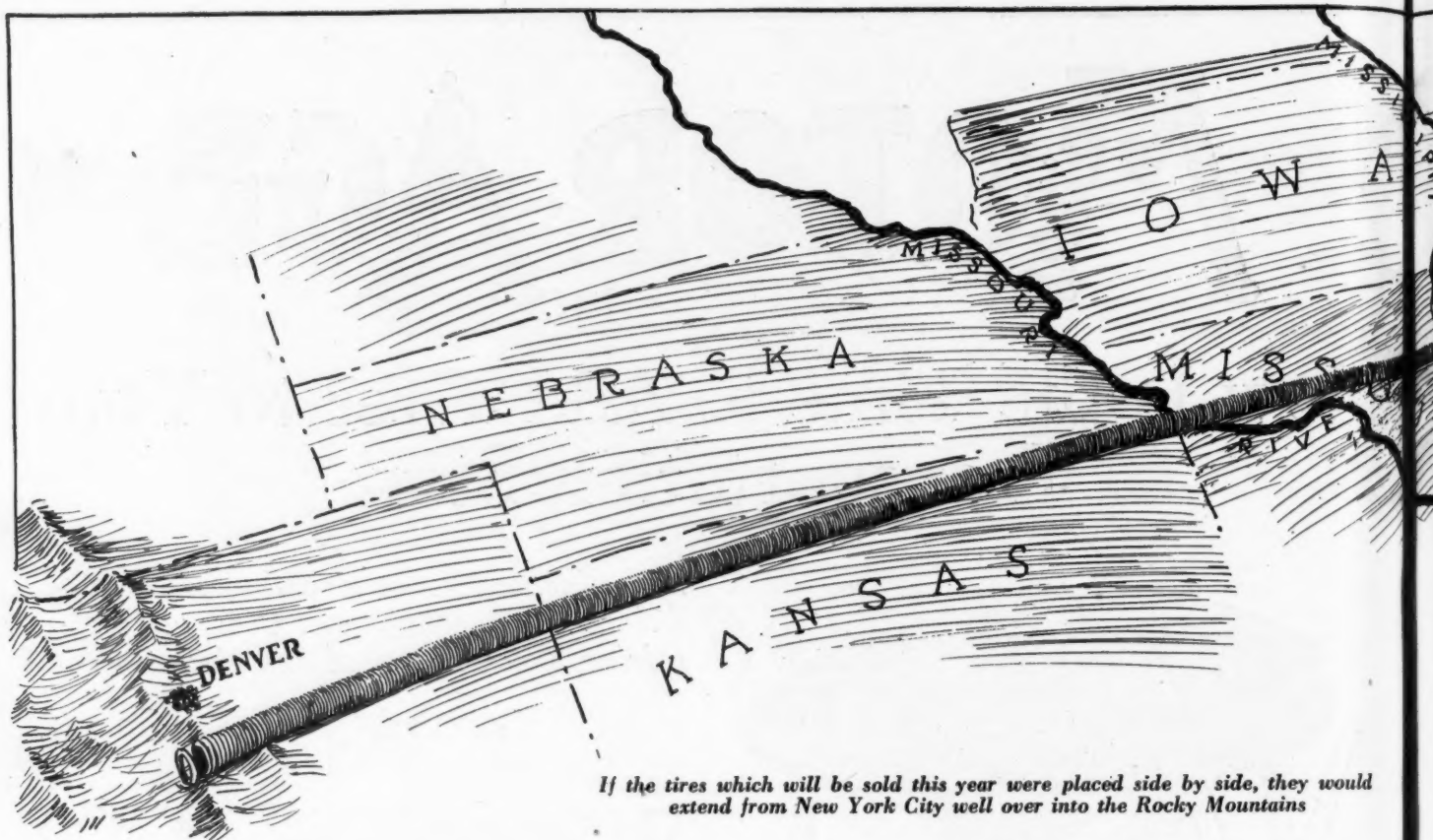
The big lesson has been learned, and probably it is worth the price. The lesson is this:

Exclusive sale of a single brand tire carries so much overhead that the wreck of the plan is certain in dull periods. No company can merchandise tires under this plan in competition with other concerns that split the tire merchandising overhead with other automotive wares.

There has been an almost right-about face on the part of the leading tire makers as to the merchandising of tires and we think it is entirely to their credit that there has been. Let us consider for a moment, tires as merchandise:

Conservative estimates are that \$750,000,000 worth of tires will be sold to automotive vehicle owners this year. The gross profit on these tires will be about \$200,000,000, if these tires are sold at reasonable retail prices. These are replacements. About 12,000,000 more





tires will be sold with new vehicles. This figure will be increased by the sale of a fifth tire with the new car.

The net profit on these tires should be about \$65,000,000, if the business is properly conducted. Allowing for careless handling, loose methods, credit losses and such incidentals to merchandising, a very conservative estimate would be \$40,000,000 net profit for the merchants.

Tires Must Be Bought

Quite a nice golden stream to pour into the laps of a selected list of dealers. Are you going to be one of these dealers?

Tires are a necessity to every automotive vehicle owner. He cannot escape buying them if he uses his vehicle, and you know that every owner of an automobile is going to use that automobile. So he is going to buy tires.

The figures already given for the amount of the tires sales for 1923 indicate that tires are taking a very high rank in value in the necessary commodities of this country and for that reason, the merchandising is important. It is the utmost of foolishness for a merchant to throw away the profits on articles that the customer cannot help buying.

So why not get right now, and get a share of this golden stream? We venture that the actual net profit on tires for the last three years has been practically nothing. Some dealers have made a profit on tires, but the bankruptcies of the gyms and price-cutters have fully offset that profit.

Changed Attitude on Tires

We shall now list a few of the changes in the attitude toward tires that lead us to believe that this is the time for honest, profit seeking merchants to get into the tire business:

1—In the reorganization of the tire merchandising, there is a very general acceptance by tire manufacturers and distributors that the exclusive representation of one line of tires is too expensive. Also that it is not well for tires to stand alone.

This is very well indicated in the fact that most successful tire dealers—those who sell only at profit making prices and stand for the right kind of service and adjustments—are taking on other lines. Batteries, accessories and similar merchandise are being taken into the establishments of the really honest-to-goodness tire dealers to help carry the overhead

and to give the ask-em-to-by man at the air pump something to talk about.

2—Tire advertising is undergoing a thorough revision. It is not necessary for any tire manufacturer or dealer to find himself confronted with the unfair type of advertising that has prevailed in the past.

The improvement in advertising has come about through the determination of the manufacturers to put their business on a higher plane and the interest of the Associated Advertising Clubs of the World. The Vigilance Committee of Advertising Club has been taking up complaints of tire advertising and publicity as they have been reported and making investigation as to the claims. Three methods of correction have been followed:

When advertising claims are shown to be unreasonable, the advertiser, whether manufacturer or dealer, is pointedly asked to quit the misrepresentation. Usually this brings about the desired result. If not, the laws are quoted.

If the offender is a dealer, the case is taken up with the manufacturer and cooperation is asked. The manufacturer has seldom failed to join with the committee in stopping misrepresentation.

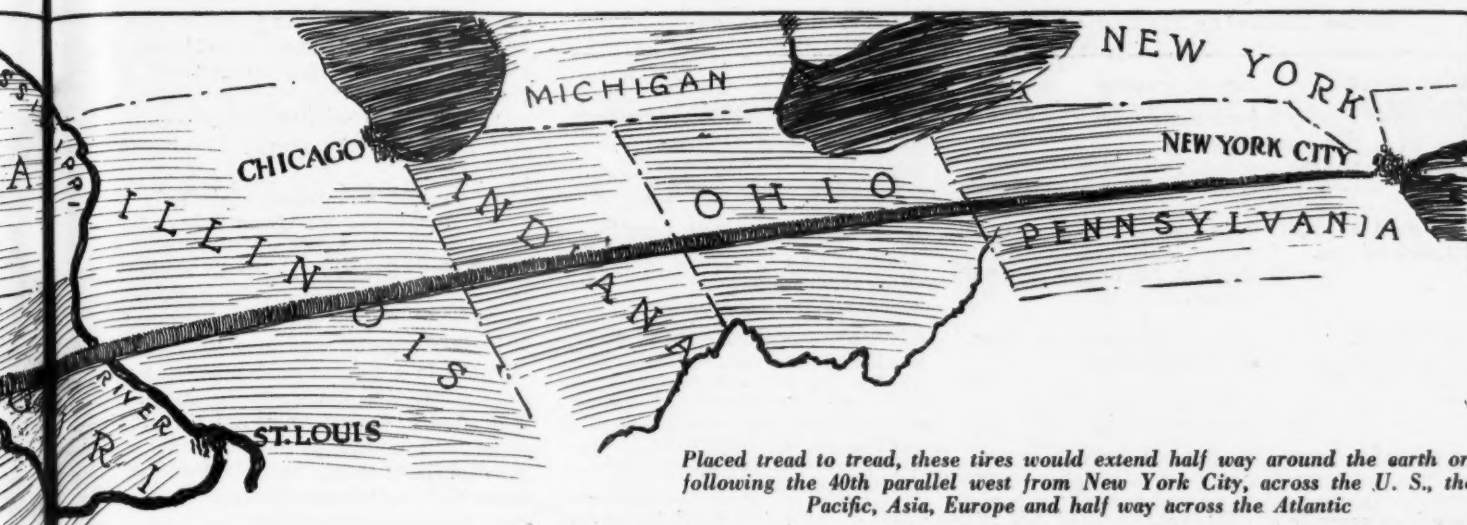
A third appeal is made to the publication, publishing the advertisement and with excellent results. When false claims are insisted upon, the publication nearly always rejects further copy.

So, if you are annoyed with false advertising by a competitor, take your case up with a Better Advertising Committee of your city or direct with the Associated Advertising Clubs of the World at 110 West 40th street, New York.

3—A much better provision is made for dealer profit this year than ever before. Conditions as to discounts have been improving steadily and will continue to improve.

This recommendation works two ways. Not only are the manufacturers of heavily advertised tires making a more reasonable discount provision—usually 30 per cent—but the smaller production tire manufacturers are making a fairer discount—one that more nearly fits the situation.

It is no secret that for many years the larger manufacturers allowed an inadequate discount, 12½ per cent. Recently this has been made 30 per cent, which is a merchandising margin.



Placed tread to tread, these tires would extend half way around the earth or, following the 40th parallel west from New York City, across the U. S., the Pacific, Asia, Europe and half way across the Atlantic

Also the other side of the picture is being repainted. The smaller companies are in the main withdrawing the "price cutting" discounts. These discounts ranged as high as 60 per cent and manufacturers never dreamed that a dealer would even try to sell at the list prices. It was the idea that the dealer would distribute the printed matter and then give the retail buyer a discount to make him think he was getting something for nothing.

This was a perfectly absurd practice, savoring the "cheap John" methods and was entirely unworthy of such good merchandise as tires.

This practice has been a big factor in unsettling the trade and the tire manufacturers who promoted it are seeing the error of their ways and are changing for the better. Any one who is familiar with the comparative prices printed regularly in The Tire Rate Book will have observed that within the last few years this spread in prices has been contracting and there is prospect of a fair list price on all tires.

4—Manufacturers are reducing the number of "exclusive" dealers, which means that there is going to be less opposition from men who must sell to exist and who resort to price to attract buyers.

When the tire business gets into proper hands, the dealers will not be dependent upon one source for daily receipts. It will mean that when tires are not selling, there will be at least an opportunity of selling some of the merchandise to keep the cash register ringing. There will be something besides tires to carry the overhead. Naturally when a tire manufacturer starts to cull his dealer list, he is going to weed out the inefficient. Manufacturers have come to learn that one insignificant price cutter in a community can drive from his dealer list every good dealer in the community.

In the past, it appeared to be the idea to sign as dealers any one who could sell a few tires. Tires got into much strange company, but these drug store, cigar shop and grocery store dealers did not make good. They sold a few tires but they did not get the automotive spirit of service and they helped the buyer mulct the company on guarantees. These are the dealers who will go out of the picture.

5—Adjustments are now made on a rule of reason—that the buyer shall get the worth of his money but that he shall not be rewarded for his own carelessness.

Have you read one of the new guarantees; the one that has replaced the former unfair "mileage guarantee?" If not, get one of these guarantees and study it. Also study the methods established by factories for adjusting these complaints. Good tire men will tell you that they go along for months without a dispute with the factory as to the adjustment of tire complaints. The rule of reason and fairness is working and a man who can judge the causes of wear on tires can pass on almost any tire presented to him.

An automobile dealer who sold \$44,000 worth of tires last year, stocks two lines and says that he did not have a dispute with either factory. His method of adjustment is to have his tire salesman, a man who knows his business, look at the

tire and pass on it first. If the customer does not agree with the salesman, they go to the vulcanizing department.

The vulcanizing department in this establishment is conducted by an expert tire man who rents space from the automobile dealer and who does all of his tire work, as well as taking in extra work. In practically every case the entire adjustment was made here on the rule of reason. A few cases of doubt were sent to the factory without reaching an agreement. Not one of the disputes that formerly made life so uncomfortable for the dealer took place during the year and not one customer was made angry.

6—Tire sales are really a service to your owners as well as added profit to you.

Tire sales by automotive dealers are really a service to the car owner customers. Did you ever listen to a woman owner or a business man when she or he says in a disgusted tone: "It is time to get my car checked up and I must drive around to the tire place, the battery station, the service shop to get some little things done."

How much better it would be if this car owner would come to your place and have the little needs cared for. And how well you could advertise a tire by writing like this to your customers:

"We are the agents for the Hyphen tire because we believe this to be a good tire for Runwell cars.

"We want to supply your tires this year, because we want all Runwell owners to have pleasant drives and we are quite sure that if you will buy Hyphen tires from us and let our tire expert adjust them, that you will have a minimum of tire troubles.

"We are always on the lookout for merchandise that makes for the comfort and pleasant travel of Runwell owners and this is one of the places where we believe that we can serve you."

It is in getting close to your customers that you gain the most. The automotive dealer who does not sell cars can get much the same results if he will carefully list his regular customers as to kind and model of car owned, keep track of what his regular customers buy from him and do his advertising on a basis of service to the owner. The more complete your automotive establishment, the more confidential can be your appeal to this customer.

It is not the intent to say here that the car dealer should sell all of the tires. We do not believe that this, whether desirable or not, will ever come about. We do mean to say, however, that a tire salesroom should be conducted in connection with other automotive merchandise and not as an exclusive store or a department of a drug store or a department store, where the spirit of automotive merchandising is not understood and never will be.

The automobile owner is much too good and liberal a customer for many things for the merchant to sell him only one item. We also believe that the properly constituted tire and accessory store is a candidate to become some day an excellent car sales agency. We are absolutely confident that

Cases Involving Misuses of Mileage and Other Guarantees

Advertised Guarantee	Investigation Showed	Date	Action and Result
New Tire Guaranteed 8 Months	Tires could not possibly give this service	Oct. 29 1922	Copy excluded from newspaper.
New Cord Tires, 10,000 miles.	Experts agreed that tires were unequal to such service	Oct. 29 1922	Newspaper rejected copy.
Guaranteed Firsts, cords, 32X4, \$16.50	Not manufacturer's guarantee	Oct. 1 1922	Offender advised his copy violated agreement fostered by the Bureau and adopted by local newspapers, that advertisements containing guarantee must specify brand or manufacturer. Co-operation assured.

Here is an example of what the Associated Advertising Clubs of the World are doing to correct misrepresentation in the advertising of automobile tires

the better merchants now connected with the automotive lines are going to develop into more complete transportation merchants; that this recent wave of exclusive dealers is passing.

There has been a feeling that one man should sell the car, another should take up the maintenance, a third the battery, the fourth the tires, a fifth the spot lights and such trimmings, a sixth the lap robes, a seventh the trunks, an eighth the touring equipment, a ninth the fuel and oil, a tenth the trimming and upholstery, an eleventh the painting, a twelfth the used car.

Probably some of the exclusive dealers are not mentioned here, but the sky of the automobile owner has been clouded by the flock of dealers preying on him to the extent that the beauties of automobile ownership have been clouded to him, just as the beauties of the modern city are clouded to the resident and visitor by the soft coal smoke clouds.

This flock of dealers is just as unnecessary as the smoke clouds.

We have said dealers were "preying" on the car owner and we mean it, from this standpoint. The automobile owner has been forced to support a dozen overheads where a greatly lessened number would have served his purpose just as well. These dealers, all fighting for existence with their backs against the wall, have been forced to charge exorbitant profits in order to gain the living they were seeking. If they did not charge these profits, they did not survive and the cost of the bankruptcy is placed in the general overhead of the automobile owner.

It is this situation that is correcting itself as the merchandising ship rights itself. The cargo is being trimmed and put in balance for the fair winds that are now coming. Many accessory jobbers are handling tires for their accessory customers. Some automobile distributors are jobbing tires for their car dealers. These tires are sold to the retail trade by men who have other merchandise to sell and the cost of taking tire orders is not as heavy as where the exclusive tire traveler places them.

Every week there are items in MOTOR AGE about tire dealers taking on accessories or accessory merchants taking on tires, or indications that the oil filling stations are going into both lines. The entire trend is away from the exclusive line merchandise, toward a more complete line.

The mechanic is seeing the opportunity offered to him and is cutting in on the business of the car dealer who by his active salesmanship has created these markets by selling cars and now he finds himself in a more and more competitive business with only his one line of profit, that of selling cars and in many cases that is none too profitable.

We rather look for the day when the successful accessory and tire dealer will be increasing his activities to cars and he will be a better dealer by far than the inexperienced men who are coming into this business with nothing to recommend them but enough money to open a car dealer's place. Recently there has been an epidemic of persuading men who

have made some money in other lines to come into the automotive field and get rich. "No experience necessary" is a frequent line.

Ask any man who has made money in this business if he thinks experience is necessary!

So we say and we feel strongly that every automotive merchant today should broaden his field of activities and his possibility of profit. He needs all he can get and his customers will welcome an opportunity to buy more things from him if he is the right kind of a merchant.

There is a former exclusive, and very successful, tire merchant in an Illinois city who has broadened his line to include many accessories and some substantial lines such as shock absorbers for which he has the exclusive distribution in his community. He says that the accessories carry his overhead and make his line of tires quite profitable.

He has seen this trend coming and has taken the steps to so that his eggs are not all in one basket.

This man does not believe that every car dealer should sell tires, but it is interesting that he makes this concession. He believes that every car dealer should have a tire connection and he is engaged in working out a method whereby he can take care of tire needs of dealers on a plan that will make a profit for the car dealer, enable him to sell extra tires with the car at a profit, and to carry a small stock of tires for the make of car that he sells.

This plan, if worked out, also will enable the car dealer to answer all of the tire needs of his customers, even to repairs.

There can be little question that this dealer sees the way the trend is carrying the trade and his move is to a very large extent self protective, but he sees in it an advantage for the car dealer and to the car dealer's customer.

As has been previously stated, this article is the first of a series on tires. The object of these articles is to point out the advantage of selling tires, the great improvements that have been made in the merchandising of tires, what changes must be made to put the tire business upon the desirable basis that it should be.

The titles of some of the articles that will be printed in early numbers of MOTOR AGE are:

Tire sales not small change, but run into amazing totals.

Manufacturers are paving the way for better tire merchandising.

Some things manufacturers can do to improve tire merchandising.

Competition you may expect in tire merchandising.

These titles only indicate what is coming. As a preparation for this series of articles, the Class Journal editorial force has made a considerable investigation of tire merchandising and has learned from an extended study of tire merchandising methods many things that are wrong in the tire merchandising scheme.

This investigation has traced tires from the manufacturing establishment to the owner, through some of the best tire stores in the country as well as some of the worst gyp places. A study of this business would not be complete without a study of the bad methods in both factory and dealer establishments.

It is not the intent of these articles, however, to merely find fault nor to find fault with only manufacturers. We shall find fault with both manufacturer and dealer and also shall tell much of the credit that goes to both. The object is to be constructive and to help to place tire merchandising on a better basis.

The type of articles mentioned will be interrupted occasionally to describe how some practical merchant is making a success of tire merchandising.

Practice Speed of Packard and Durant Cars Indicates Records Will Be Broken— Murphy Makes One Lap at 1:26.3

INDIANAPOLIS, May 19—(By Special Wire)—Railbirds' Convention still convening although almost eclipsed by activities of Speedway Publicity artists. Many delegates absent yesterday were finally located at track searching for "tall elegant knights," "foxes of the racing game" and "monoplane bodies." Indoor driving and "surprise bombs" still blasting secrecy but everyone is deadlocked on picking winner. Closing report next week.

This week finds increased activity at the Speedway with the cars checking in as follows: Bugattis, Millers, Mercedes, Durants, Packards, Barber Warnock and Scheels' at the track. The Duesenbergs and the Clemons Special are in the city and expected for practice this week. As yet no word has been received from the Spark Plug car, the Rolland Piliat, Schmidt, and F. H. W. entries.

Mercedes Driven to Loading Wharf

The Mercedes cars did not arrive until late Friday afternoon, being lost in transit. Considerable trouble was experienced by the Daimler Co., in getting these cars to the seaboard shipping point as no railroad facilities were available. The presence of license tags, mud, headlights and a bulb horn on each was explained by the Mercedes team manager who states that the cars were driven overland under their own power, a distance of two hundred miles to the loading wharf.

The cars look heavy compared with the American jobs but this may be accounted for by the fact that they are the only two place cars entered and the

bodies are naturally wider. The frames have a kickup over the front axle and carry a four-speed transmission. The steering is right-handed and the service brakes are mounted on the front wheels. There are no brakes on the rear wheels.

Specifications of Bugatti Cars

The four cylinder engine, which will turn up 4800 revolutions, is equipped with a single carburetor in conjunction with a supercharger. The supercharger is of the turbine type and driven off the crankshaft at front. Two overhead camshafts actuate the valves. It is said the cars are capable of a maximum speed of 120 miles per hour. The ignition is by Bosch magneto to a single spark plug in each cylinder. They have not been officially clocked but stop watches have credited them with laps at 100 miles per hour.

The specifications of the Bugattis have been supplied by the MOTOR AGE foreign correspondent, who took the opportunity to inspect the cars before they were shipped from the factory. Ettore Bugatti of Molsheim, Alsace, France, states that these cars are stock sport models with only such detailed changes as are necessary for the special conditions of the Indianapolis track.

The single seater bodies for these cars have been designed by the French aviation engineer Bechereau, who was responsible, during the war, for the design of Spad scout planes. As no changes of importance could be made in the chassis, the maximum width of the bodies is appreciably greater than that of the majority of American cars. The driver

is placed centrally in the chassis, with his eyes just above the level of the scuttle and the top of his head flush with the top of the tail; this part is streamlined with the pilot's head, as in aviation practice.

Eight cylinders, cast in two blocks of four, of 60 by 88 mm. bore and stroke, are mounted on an aluminum basechamber which is carried directly on the chassis frame members. The cylinder blocks are rectangular, and the timing gear housing at the forward end is also squared off, giving a box-like appearance to the engine.

The detachable cylinder head, having a lapped joint, carries three vertical valves (two admission and one exhaust) operated by a single overhead camshaft mounted in three ball bearings. Light followers are interposed between the cams and the valves, the two shafts carrying these rockers, being hollow and forming oil leads through which lubricant is delivered directly to the cam face. Maximum engine speed is 4800 to 5000 revolutions, and the power developed is declared to be 104.

A two-piece assembled crankshaft, carried in three ball bearings, is made use of, with I-section white metallized connecting rods and aluminum pistons having four narrow steel compression rings. Normally the 122 inch Bugattis are fitted with a couple of Zenith carburetors, but it is probable that they will be run at Indianapolis with four carburetors, and that benzol, or a mixture of benzol and gasoline will be used as fuel. Compression has been raised above normal with a view to the use of benzol.



Two views of the Barber Warnock Special entered by Ford agent in Indianapolis. Sleeves are inserted to bring the bore to $3\frac{1}{8}$ in.

Normally, ignition is assured by a high tension magneto mounted on the aluminum dashboard and driven off the tail end of the overhead camshaft by a fabric, universal jointed, shaft. In some of the races use has been made of a couple of magnetos, with external gears, and in others the Marelli combined generator and distributor has been employed. It probably will depend on track tests as to which type is definitely adopted.

Engine lubrication is assured by means of a gear type pump driven off the right hand end of a cross shaft, the opposite end of which operates the water circulating pump. The oil is delivered direct to the three main bearings and to collector rings by means of which it is carried centrifugally to the connecting rod bearings. In addition there are direct leads from an external oil pipe on to the crankshaft webs, the oil thus projected being taken up in collector grooves and delivered centrifugally to the connecting rod bearings.

Other external leads take the oil to the rear end of the rocker arm shafts, the return being by the front housing containing the bevel gears and vertical shaft driving the overhead camshaft. There is also a direct oil lead to the steering gearbox. All the oil is contained in an aluminum casting bolted to the basechamber and fitted with longitudinal copper tubes, open at both ends, for cooling purposes.

A multiple disc clutch is used. The four speed gearbox is separate from the engine and is carried on the frame members. The mounting is not direct, for there is an L-section member bolted inside the channel of the frame, to which the box is hung. Drive is by open propeller shaft with two metallic joints to the bevel gear rear axle, the housing of which is formed of two taper tubes machined from the billet, and a central aluminum casting split vertically.

Rear springs are of the now well-

known Bugatti inverted quarter elliptic type, the thick end of which is attached to the extremity of the chassis, and the main leaf being carried forward and secured by an eye bolt to a bracket on the axle housing.

Unusual Construction Used on Bugattis

There is a rather unusual use in the Bugatti chassis of leather universals and links. Examples are the channel section pressed steel torque member, which is bolted at the rear to the differential housing and at the front end is attached by a double leather link and a couple of pins to the rear face of the gearbox.

There is a somewhat similar use of leather for the transverse tie rod. This connection consists of two steel tubes with flattened ends attached by a couple of bolts to oval-shaped blocks of compressed chrome leather having a top and a bottom plate of steel. A socket is formed in the leather for the usual type of ball, the taper stem of which is mounted in the steering arm in the normal manner.

There is also a flexible connection by means of a leather disc, forming universal, between the steering column and the steering worm shaft. With a flexible steel spider for the steering wheel, it is claimed that all vibration is absorbed, and that danger of the fracture of steering gear parts is lessened. Rubber links are also made use of for connection between the friction type shock absorbers and the axle.

Brakes are fitted on both the front and rear wheels, the former being of the hydraulic type, applied by the pedal, and

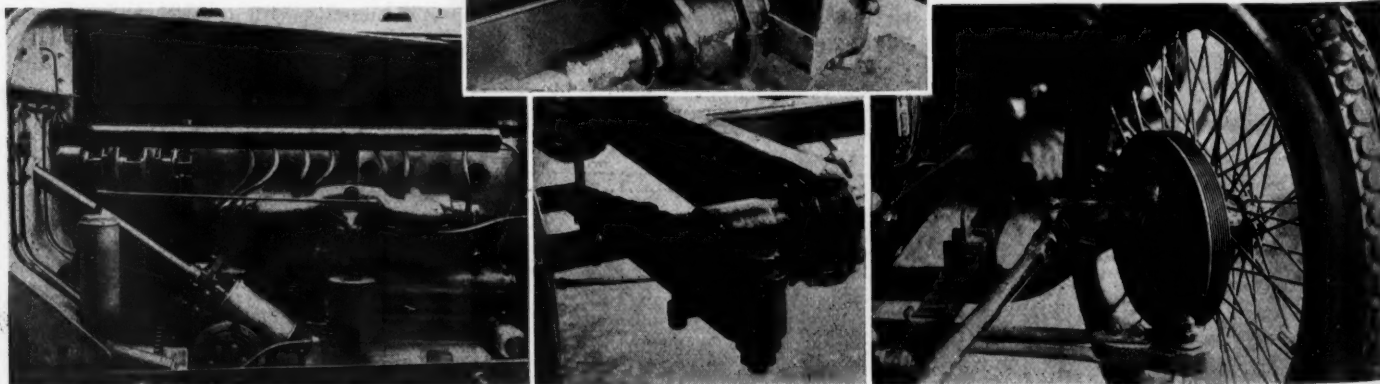
the latter, of very much bigger diameter, being hand operated. There is no brake on the transmission. The French cars will be run in the race with American straight side tires, of either 28 by 4 or 29 by 4½ inch size. Wheelbase is 94 in., track 47 in., width of frame 27.5 in., and weight without supplies aboard is given as 1433 pounds.

The Packards are by far the most beautiful jobs on the track, and as for speed they are probably as fast as the Miller engined cars. De Palma was timed at 1:27:80 for his fastest lap and Boyer and Resta are still to be heard from.

The bodies are done in Packard blue. The front and rear axles, which are machined all over, are finished in gun metal plate. The wheelbase is 100 in. and the tread is standard 56 in. The foot brakes are of the internal expanding type acting on the rear wheels. The hand brake is mounted on the transmission. The six cylinder engine has two overhead camshafts and six carbureters. Ignition is supplied by magneto. Contrary to the general impression these cars were not constructed by Harry Miller.

Harry Miller brought three cars with him from the Pacific coast which were entered as Miller Specials. Two of these cars have since been sold to Harry C. Stutz who has taken them over to his factory where they are receiving several coats of white paint to make them resemble, to some extent, the old time white Stutzes. Tom Milton and Howard Wilcox have been selected by Stutz to drive the cars which are campaigning under the name of H. C. S. Specials.

The car known as the Clemons Special is due to be tested Tuesday or Wednesday. This is an Indianapolis product designed, and being built, by L. C. Miller and Fred C. Clemons in a machine shop on Scioto Street. In the same shop Leon Duray is laboring day and night on the



Extensive use is made of leather and fabric in the 8 cylinder Bugatti.

Left: The ignition unit is mounted on the aluminum dashboard and driven from an extension of the camshaft. Attention is called to the leather disc inserted in the steering column shaft. It is claimed that very little road shock is transmitted to the wheel with this construction.

Lower center: The spring suspension on the Indianapolis Bugatti is the same as on the stock car. Rubber links connect the shock absorbers to the axle.

Upper center: Another application of the non-metallic fitting is shown in this picture of the torque arm front anchorage. The rubber fabric link makes a flexible and noiseless installation.

Right: This view shows an interesting application of chrome leather to the steering arm and tie rod. A socket is formed in the leather for the usual ball.

big job of cutting down an 183 in. Durant to a 122 in. size. He is due out Thursday or Friday.

The Duesenberg engines will be block tested Sunday and Fred Duesenberg states he will have at least one of them installed in its duralumin framed chassis by Wednesday.

Fast Time Expected This Year

There are so many angles to be considered about the race this year that not even the wisest of the dopesters has made a worthwhile prediction. The qualifying trials will not be run off until Saturday, May 26, but De Palma's lap at 1:27:80 and Jimmy Murphy's at 1:26:3 give an insight to the possibilities of the small cars. The trouble with forecasters this year is that they are confronted with the classiest field of race cars that has ever assembled on one track. They are also up against the proposition of picking a favorite from among the starriest collection of drivers that ever competed for the honor of an Indianapolis victory. Last but not least they know but little about the probable conduct of these light

cars on a track like Indianapolis for such a long distance as 500 miles.

Although the 122 in. cars give every appearance of being faster than the cars of last year and have actually broken the official track record for one lap, no one seems nervy enough to venture a figure for the average speed of the winner.

The facts that stand out most prominently to date are that, although 1/3 smaller than the 183 in. engine, the 122 in. engine will give off more than 2/3 of the power of the 183 in. job. The reduction in the minimum weight limit has made possible a car that has a lower power to weight ratio. Last year it was about 16 pounds to the horsepower, this year it will not exceed 14 pounds to the horsepower. This means, potentially at least, a faster car but it must be recalled that the track is brick surfaced and that the turns are such that the 183 in. cars would skid decidedly when doing a 1:29 lap.

The race was won at an average speed of 95 miles per hour which means that the turns were being negotiated at as fast a speed as human skill and rubber tires would permit. This brings us to the

human element which is accentuated by the one man body. The driver this year must know his engine because he alone will be called on to diagnose when she starts missing or when the tachometer shows the first signs of a weakening engine.

One man of the pit crew will help him make any repairs, but that one man will not have been riding and the driver must supply the working directions. Then there is the question of comfort while driving but, after all, it is more than probable that the biggest factor is the ability of the car to accelerate up to maximum speed between turns, that is on the main and back stretch. From what we have heard of the conduct of the cars in practise they are faster on the main and backstretch, after taking the turn at a non skidding speed, than were the cars of last year, if this be true we believe that the 122 in. car will equal at least, the record established last year.

The winner should be an American car, with the Miller engined cars, dividing honors with the Packards and with the probable chance of the Duesenbergs playing the dark horse role.

The Ultra in Streamlining A Closed Car



Here is shown a streamlined closed car which has been worked out by the aviation engineers of the Forman Automobile Co. in France. The car was built for competition in speed contests, hill climbs, etc. The car weighs but 3,140 lbs. and is equipped with a six cylinder engine developing more than 200 h. p. on the block. The main frame members and the whole of the under portion of the car are enclosed to secure streamlining. Only the brake drums and two extra extremities of the front axle are exposed. The total height of the sedan is 5 ft. 2 in. To gain admission a portion of the flat fender is hinged and one half of the roof is raised. The battery, tool box, etc. are carried between the frame members back of the axle.

Cafeteria for Employes Pays Automotive Company through Increased Efficiency of Personnel

THE Butler Motor Company, of Kansas City, Mo., has installed a cafeteria in its building. This arrangement has been found to serve many useful purposes, of convenience and increased efficiency for personnel.

The building is located more than a mile from the business districts; the nearest good restaurant is several blocks away—and its prices are rather high for the average employe. Formerly many employes went, by street car or motor car, some distances for luncheon or brought cold lunches from home. Service department men had to hustle to clean up, go out for luncheon, and get back in 30 minutes—and their noon meal could never be satisfactory. Salesmen ate wherever they happened to be around noon, not planning to "make the office" during the day.

The company arranged dinners frequently for one or another group of employes, service, sales, office. These dinners had to be held at some hotel downtown club, or outside tea room. Now that a cafeteria is available in the building, the employes are wondering how they ever got along without it.

Convenience and Economy Appeal to All

The service men can clean up, eat at leisure and in comfort and have time for a smoke afterwards if they desire.

The office girls and men are now getting warm luncheons without haste or loss of time—and at moderate expense, much less than they would have to pay downtown, even if the carfare or gasoline is counted out of the expense. Some of them still bring the heavier features of their luncheons from home, but can get a cup of coffee for five cents, a piece of pie for five cents, to help out the home food.

Fully half of the outside personnel, who formerly ate "catch as catch can," are now coming to the building for the noon meal and getting good food every day.

The officers and managers of the company eat in the cafeteria nearly every day, not only because of convenience, but because they like the meals, and because they here can talk casually with others of the organization, promoting the personal contacts.

Not a day passes that some salesman does not bring a prospect to lunch with him in the cafeteria—and many a sale is consummated because of this situation. Dealers who come to call upon the Butler Motor Company as their distributor, eat luncheon at least, in this cafeteria—and not a minute of time in the city is wasted.



This dining room which is used by the service men also serves for conferences, sales meetings and a similar room is devoted to office employees during the lunch period

The evening dinners for small or large groups of employes, are now held in the dining room, served from the cafeteria kitchen. Recently, a service department dinner was given here, at which 80 men were served with a meal that would probably cost \$1.50 to \$2 downtown—and all the paraphernalia, as well as the atmosphere, were at hand for the talks and discussions after the meal.

The kitchen equipment and utensils, tables, silver and dishes, are adequate for serving 150 at an evening dinner. The annual and other banquets of the organization, particularly those at Christmas, can be held here.

With the ample equipment, and the space available, far more could be served at noon, than 125 employes of the Butler Motor Company. But the company is not offering this dining facility to the general public of its district. Invitation has, however, been extended to some of the small manufacturing establishments in the neighborhood, suggesting that the young ladies of their organization will be welcome here.

Many of these are visiting the Butler cafeteria at noons—accepting the opportunity as a courtesy from the Butler Motor Company. Their employers are of course, appreciative of this courtesy, whereby the young ladies find the handicap of employment in the district obviated.

Stimulating a Sense of Permanency

The Butler Motor Company has looked to the development of sense of permanency in their jobs for employes, as one effect of the installation of the cafeteria. Present and future employes are not

depressed by the thought that they will always have to hustle at noon for luncheon.

The two dining rooms, one for service employes and one for girls and office personnel and visitors, occupy rooms used at other times for conferences, sales meetings, evening group meetings, and for the school for owners. The only space withdrawn from other uses for the exclusive service of the eating facilities, is that for kitchen.

The company spared no expense in ample equipment of the kitchen—but this ended the investment. The revenue cares for running expenses.

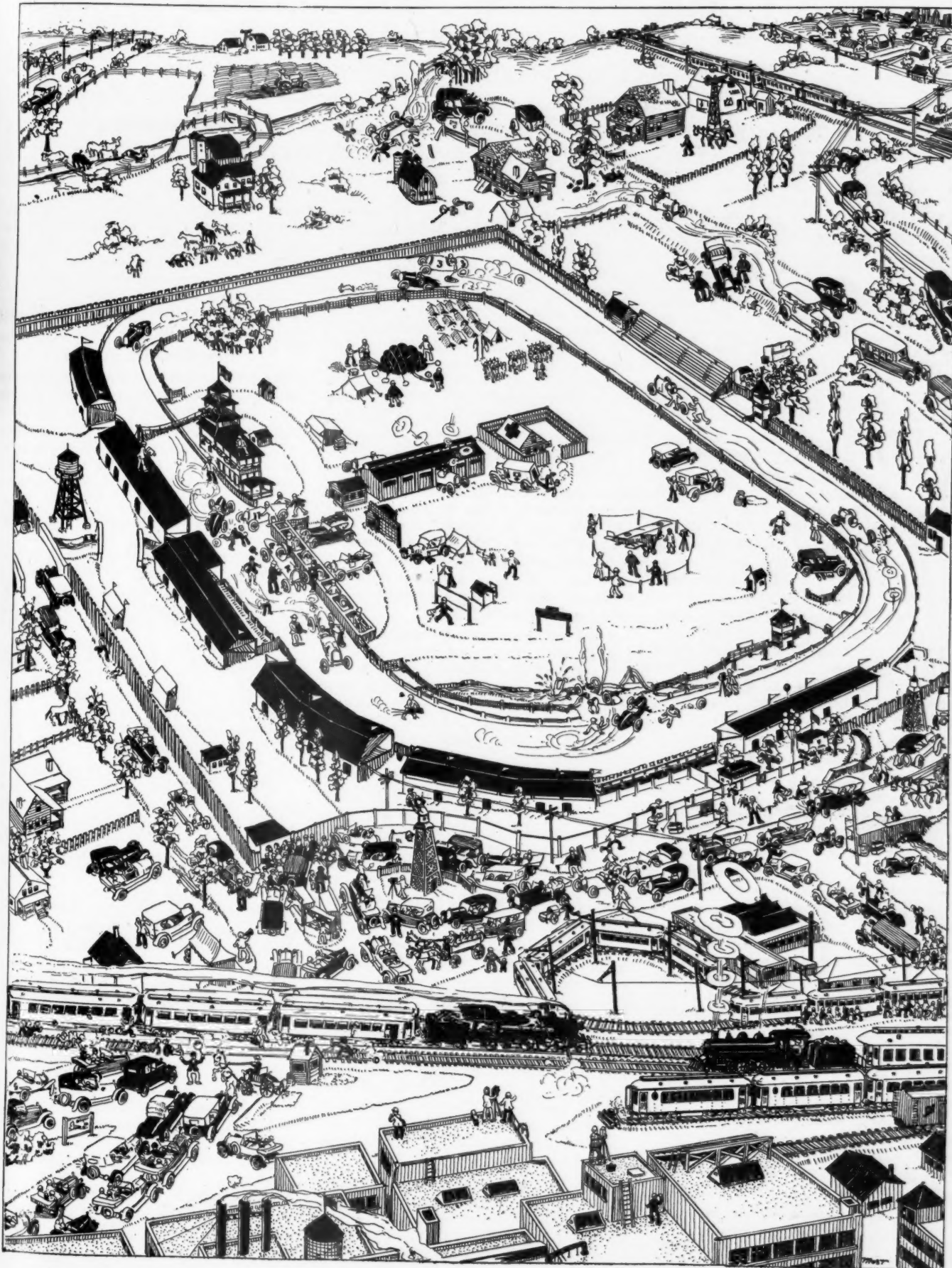
Geo. P. Pauer, manager of the cafeteria, is delivery superintendent of the company. He had, previous to joining the company, had experience in restaurant business, and is an expert dietitian—providing variety of menus day by day to round out food requirements, and menus of really scientific value daily.

The only employes exclusively on cafeteria payroll are the chef, his wife and daughter, who cook and serve the food. This chef is a good one, with wide experience in high class hotels and clubs, and on ocean liners.

Who is responsible for excessive trade-in allowances on used cars? Does the car owner choose the dealer that offers the highest bid on his old car? See what the answer to these questions is as indicated by a survey of car owners, by the Portland, Ore., Dealers' Association, page 49 of this issue.

The Gas Bugs Are Back Again

By CARL A. MOST



N. A. C. C. Service Managers Favor Boosting Local Service Associations

Committee Also Appointed to Draft Owners' Creed to Be Sent Out by Factory Advertising Department in Its Literature. Delegates in General Favor Flat Rate System. Individual Service Idea, Set Forth by Manager of Detroit Cadillac Branch, Well Received

DETROIT, May 17—One of the service managers' convention held here May 15 and 16, was the fact that the factory service managers pledged their support to local service associations. While it is felt that it is not up to the factory service manager to establish such associations, it is evident that the factory service manager can do much good in urging dealer service managers to join and support such local associations.

Prepare Owners' Creed

A motion also was made and carried, whereby a committee was appointed to draft a sort of owners' creed and to be sent out from time to time by the advertising managers of the factories in their literature and newspaper advertising. This creed will be built essentially around the thought that the car owner, in buying a new car, has given a piece of machinery which requires periodic attention. Adjustment, intelligent lubrication and the general protection of the property in which he has made his investment will constitute the bulk of the text.

The committee is headed by A. B. Cumner, vice-president of the Auto-car Sales and Service Co., and includes W. M. Warner of Cadillac; R. A. Shelly, Dort; F. A. Bonham, Durant, and Clyde Jennings, editor MOTOR AGE.

The meeting opened with a general session Tuesday morning at which B. G. Koether, in charge of sales, service and advertising advisory staff, General Motors Corp., made an address. The major part of his talk was devoted to painting a general picture of the industry, chiefly as regards its assets and liabilities. He mentioned the fact that taxicabs, buses and electric railroads are putting forth efforts to better their services and that, therefore, the automotive industry, chiefly as regards passenger cars and trucks, had stiff competition to contend with. He mentioned that the chief liabilities of the industry today were, adverse legislation, poor service, competition and accidents.

In mentioning the assets, Koether stated that four things stood out prominently. These are:

- 1—Everybody wants an automobile.
- 2—Car prices constantly are lowering, generally speaking.

3—It is easy to buy a car these days, owing to various plans for payment.

4—Service is being improved.

"How to Overcome Paint Troubles" was the title of a talk given by L. V. Pulsifer, vice-president, Valentine & Co. While the main part of his talk was devoted to the problems of the factory paint department, there were one or two things of interest to the service manager and the dealer, as regards paint jobs.

Peeling of paint is usually due to improper preparation of the metal, Pulsifer said. Also, checking of the finish is due to the chemical action of the rays of the sun. It will be noticed that surfaces such as the top of the cowl and decks of roadsters will invariably show signs of checking first. This is because such surfaces are more directly exposed to the action of the sun's rays.

Some service managers may have had trouble with blue paint jobs. This, the speaker said, is because blue is a dangerous color unless precaution is taken to apply a coat of clear varnish between the last color coat and the finish coat of varnish. The varnish over the blue must be waterproof, otherwise the moisture in the blue will penetrate.

Pulsifer stated that one of the best things the dealer's service manager can do is to urge the car owner to have a coat of varnish applied to his car just as soon as the first signs of checking appeared. If this is done the finish will last for a considerable time. Otherwise it means a complete refinish job.

Individual Service Policy

One of the most interesting talks was given by Richard Harfst, General Manager, Cadillac Motor Car Co., Detroit Branch. He dwelt particularly on the individual service idea which his company has put into effect. By this plan the car owner, each time he drives in for service, is taken care of by the same service salesman. This man ascertains his wants, follows the job through the shop, inspects it and turns it over to the customer.

Thus the service salesman becomes acquainted with the cars of certain owners and is in a better position to follow up the work which has been done on them than would be the case if he attended to the wants of owners in general as

they happened to come in. Thus, when a customer comes in he asks for the particular service salesman; the two know each other by name and the customer not only feels that he is getting, but actually does get, individual service. It is just like asking for a favorite clerk in a shoe store to wait upon you.

Flat Rate Discussion

The latter part of Tuesday afternoon was devoted to discussion of the flat rate system. While there was a variety of opinion expressed as to what was meant by the flat rate system, the consensus of opinion was that it is the best plan yet brought forth for the selling of maintenance and service.

It really makes little difference what we call it, the chief thing to bear in mind is that the customer wants to know what the job is going to cost him. Also it is well to bear in mind that of all the hundreds of dealers using the flat rate system, not one of them is in favor of ever going back to the old method of charging a man for a job at so much per hour. The flat rate is sweeping the country, as one speaker said, which in itself is proof that the theory behind it is fundamentally sound and that it is being demanded by the car owner.

J. H. Newmark, Manager of Sales Promotion, Durant Motors, in a talk on sales promotion through advertising, stated that the dealer must first put his house in order before any promotion can be done. There is little use, he said, in trying to advertise if the foundation of the structure is not sound. He placed special stress upon the necessity for doing the obvious things, too often overlooked by the dealer in the rendering of service.

The automobile, Newmark said, is a piece of transportation machinery which will wear just as any other piece of similar equipment does. He cited the case of the locomotive which is inspected and adjusted by seven men at the end of a 140-mile run, and went on to say that the automobile often travels thousands of miles without the owner having the obvious things done to it, which the dealer ought to make clear should be done.

The method of instructing dealers' mechanics at the Cadillac factory was explained by T. W. Holloway, Assistant Technical Manager, Cadillac Motor Car Co.

On this, the daily distribution sheet, is listed every transaction of the day. It acts as a daily barometer, showing the exact condition of every department and of the business as a whole. From it are made important entries into the general ledger

Burroughs Simplified Garage Accounting Plan
IMPORTANT DAILY FIGURE FACTS

DUE ME	AMOUNT
MONEY IN BANK (FROM ACCT NO 2)	2,311.21
DUE FROM CUSTOMERS (FROM ACCT NO 3)	4,431.12
DUE ME ON NOTES RECEIVABLE (FROM ACCT NO 5)	1,370.00
TOTAL	8,112.33 *
MONEY OWED	AMOUNT
OWED FOR PURCHASES (FROM ACCT NO 10)	3,675.37
OWED ON NOTES GIVEN (FROM ACCT NO 11)	3,125.00
TOTAL	6,800.37 *
FIGURES WHICH INDICATE TENDENCY OF BUSINESS	AMOUNT
CASH RECEIVED ON ACCOUNT TODAY (FROM NO 3) WATCH RELATION TO CHARGE SALES	178.30
TOTAL SALES TODAY (FROM ACCT NO 20) COMPARE WITH AVERAGE	316.68
COST OF SALES TODAY (FROM ACCT NO 21) WATCH RELATION TO SALES	187.78
TOTAL SALES TO DATE (FROM ACCT NO 20 THIS MONTH) COMPARE WITH PREVIOUS PERIODS	720.98
CONTINGENT LIABILITY ON ENDORSED PAPER—ACCT 16 WATCH CAREFULLY	6,868.00
GRATIS SERVICE EXPENSE (FROM ACCT 29) THIS MONTH WATCH PERCENTAGE TO CAR SALES	11.20
TOTAL EXPENSE TO DATE (FROM ACCTS. 29-39 INC) THIS MONTH KEEP THIS FIGURE DOWN	228.70
PROFITS FROM DISCOUNTS TAKEN (FROM ACCT NO 22) THIS MONTH BE SURE ALL DISCOUNTS ARE TAKEN	10.00

The reverse of the daily distribution sheet shows these figures. With these records complete, is it possible for the dealer to know each day, just how his business stands

(Continued from preceding page)
part there is in stock. In the case illustrated, piston rings are used as an example. This gives an accurate account of how much is sold and when more of the supply is needed.

The parts order, shown in the same illustration, gives a record of the time and amounts of removals from this stock. In the stores ledger, finally, is kept an office record of the stock.

The monthly business statement lists, under statement of earnings, every transaction of the month, showing sales, cost of sales, expenses and losses and miscellaneous revenue. The net income is also shown here. Under the statement of values owned and debts owed, the net investment is given.

23 Years Ago This Week In MOTOR AGE

(FROM MOTOR AGE OF MAY 24, 1900.)

From Medicine to Automobiles

The An-T-Phat Co. of Chicago has certified to a change of name to the Chicago Automobile Co. and to a change of business from marketing patent medicines to manufacturing motor vehicles and appliances.

Every Town Wanted One

Pottsville, Pa., is to have an automobile factory. John Reber, proprietor of a hosiery mill there, will be at the head of it. Mr. Reber has been experimenting along this line for several months, and the successful trial trip last week of a machine constructed after his plans has been the means of interesting several of his fellow townsmen in the new venture.

Eastman Made a Steam Car for \$1000

The Eastman Automobile Co. of Cleveland makes its bow to the public in a neat catalog just from the printer's hands. The company is incorporated under the laws of West Virginia and is officered as follows: H. F. Eastman, president; F. M. Mills, vice-president; L. C. McLouth, secretary, and H. Hawes, treasurer and general manager. Mr. Eastman is an old bicycle man formerly with the Winton Bicycle Co.

Couldn't Face the Storm

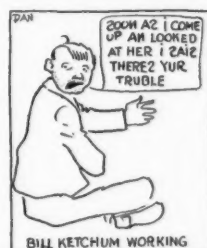
NEW YORK. May 19—Vice-President Chamberlain and Mr. Schwarzkopf were the only members to appear at Astor Court this morning in the face of the driving rain storm for the run to Tarrytown, and so it was very excusably abandoned. It was a sad disappointment to the chauffeurs, as sixteen vehicles had promised to go and luncheon had been ordered for 26 at Tarrytown.

Dan's Diary

MAY 18—Me an the boss is getting along pretty good now him helpin me out in the shop some or maybe helpin him out cuz when he is in the shop i aint shop boss no more. He spoke again yestiday about hiring Bill Ketchum to help us out in the shop him not caring much for the shop work thats plain enuf also me not caring much for Bill Ketchum him makin more talk than doing work.

MAY 21—I got to talking with a young fellow me selling him gas for his Ford speedster wich he bilt himself out of a old ford wich his dad thru away when he got a Buick the Ford being shot. He must be a pretty good mecanick cuz the Ford speedster will do 65 mi. most any time when give me a rid i thot it was a 100 but he said not. Anyhow he wants to learn the biznis and maybe this is a chance to sidetrack the boss

about Bill Ketchum. Gee i can get more work out of a green horn that wants to learn than out of two wise guys that nose it all an wants to



tell about it all the time stead of doing it, also bragging about some guys car that nobody could start and then they starts it, them guys make me tired.

MAY 22—Holy smoke i wish the boss would let me go to the Indianapolis race next week. I no a guy thats going to drive down and will give me a ride.

A Building to Be Proud of

MOTOR AGE Plants Seed that Grows Into One of the Most Modern and Best Equipped Buildings in Pennsylvania

WAY back in November, 1919, the Butler Buick company wrote to MOTOR AGE, sending a sketch plan of a proposed new building which it intended to build, and asked suggestions. In the December 4th issue of MOTOR AGE there appeared garage plan No. 140, which was the answer to this letter. It was a comparatively complete layout for a two-story building, having 90 ft. frontage and 180 ft. depth. The members of the company did considerable thinking and it was not long before they were back for more suggestions and criticisms. MOTOR AGE replied with further pencil suggestions and the plans were finally brought to the point of satisfaction.

Then came a letter saying that bids had been taken on the job and that the cost was going to be so high that the project would have to be postponed for the present.

Like many another concern, however, they found that the new building must be built at any cost; the need was imperative and the time seemed to be right. The plans were revamped to some extent, the size being reduced and another floor and basement added, making a structure 85 by 111 ft. with three stories and basement.

From the time the first sketches were started till the building was well under way, trips were made to neighboring towns and states to get all the latest wrinkles and it is doubtful if there is anywhere else a building containing more refinements for the easy handling and serving of cars.

Fundamental Suggestions Not Changed

The strange part of the whole story is that through all the evolution and refining process, covering a period of about three years before building operations really started, most of the fundamental suggestions offered by the MOTOR AGE architectural service have stuck and are to be found in the new building.

The building was opened recently with a grand celebration lasting all week, during which flowers and music played an important part in making all visitors have an enjoyable time. It is a very imposing structure of tapestry brick and takes its place proudly in the Butler landscape.

Upon entering the new building, the firm has injected a little more personality into its name and is now known as the Cheesman-Watson Company and will handle the Buick, Cadillac and G. M. C. lines.

On the main floor are found the show-

rooms facing Main street and running the full width of the floor, the offices of the company, ladies' rest room and accessories room with lobby and front facing Clay street and at the rear the company's service department.

In the accessories room or parts department upward of 20,000 auto parts are carried in neat steel cabinets. Above this department on a mezzanine floor are found additional parts of larger size than those carried below. The quick service department at the rear of the first floor extends the full width of the building with an entrance off Clay street. Here is located the freight elevator, approachable from the outside or the building interior. At the rear of the main floor is a spacious canopy under which motorists can drive in out of the weather for shelter.

Clear View a Feature

Windows in partitions between the various departments on the first floor are so arranged as to give anyone in the main office a clear view of the entire first floor. All departments, throughout the building, are equipped with telephones connecting with a switchboard in the main office, on the first floor. An auto-call system makes it possible for anyone in the main office to call any employe of the company by means of a set of signals, the employe responding by telephone or in person.

The master clock in the main office, with the aid of the electrical mechanism in the accessories department, governs every clock in the building. Job clocks are provided in goodly number by means of which repairmen can keep an accurate account of time devoted to any particular job and register it on cards provided for that purpose. The cards are placed in a tube which permits them to be conveyed instantly by gravity to the main office. By means of the clock system efficiency is promoted in every section of the plant.

Another feature is the two and one-half inch pipe buried in the concrete portion of the shop floor and emptying into the smokestack. Exhaust pipes of cars are connected to this pipe and fumes and noxious gases are carried out of the building.

The basement is used for car storage and is guarded as well as possible against moisture. The entire second floor is devoted to the used car department with display windows both in front and on the Clay street side. On the third floor are found the machine shop with opaque glass windows that diffuse the light and give much the same effect as natural day-

light throughout the floor. There is a creosote block floor which is greatly appreciated by employes of this department, who are almost constantly on their feet.

At the rear of this floor and separated from the main part only by a steel netting is the machine room containing lathes, presses and a forge. Many of the machines have individual motors. Work benches extending the full length and width of the main room prove an additional advantage to workmen in this department.

All rain water is preserved in a concrete tank and filtered for radiator use. Another feature is the system of plugs throughout the building over which auto can be driven and crank case oil emptied. This idea originated with the builders themselves. Oil that drips into these openings finds its way through pipes to a storage tank in the basement. A gravity oil system is installed on the main floor supplying 8 grades of oil to the quick service room as well as to an outside dispensary.

The manner in which this company has made use of MOTOR AGE planning service serves as a shining example to those intending to build. There are certain fundamentals which should be carefully considered before a shovel of earth is moved. The man who starts his foundation and then wonders how to finish it will never have a complete structure like this.

INJUNCTION TIES UP NORTHWAY

NATICK, Mass., May 19—The workers at the Northway Motor Corp. are dejected because the payroll for last week has been held up by an injunction secured by Ralph C. Northway as a result of the controversy over the control of the property following the meeting a short time ago. He is contesting the legality of the stockholders meeting giving control to John H. Mach, and the election of officers, and both sides have been seeking to run the plant ever since. The trustees got a temporary injunction restraining Northway from running the concern and then he got one tying up the funds of the corporation. Now the whole thing will have to be threshed out in court.

There is an interesting explanation of the meaning of torque in The Readers' Clearing House. Turn to page 42 and look it over.

An Ideal Electrical Service Station in the Making No. 9

A Test Bench Cuts Out the Comebacks and Makes the Shop Look Like a Real Place of Business

"A N' you'll never lack for money if you've got the line of talk." It was the last line of the chorus. The vaudeville artist bowed to the audience and skipped from the stage. His sketch was intended to amuse, but behind the words was a lesson of real import. The line of talk, the ability to impress the customer with the value of your product and the sincerity of your endeavor to give good service is essential if a lasting and successful business is to be established.

We may not all be skilled at saying just the right thing and having sense enough not to say too much, but there are many other ways in which we can show the customer that we are able to handle his work properly. One of the greatest of these in the electrical service station is right equipment for the job.

It is needed to do the work right and eliminate guessing. It shortens the time per job and makes more jobs per day and more profits possible. It eliminates comebacks and enables you to know that when the generator goes back on the car, it is right and will not have to be pulled off again due to something overlooked.

More than this, however, it makes an impressive display. The customer does not know anything about electricity. The meters are a mystery to him and the display of equipment makes it possible to sell the customer on the value of the

Your Time Should Be Most Valuable Building Up Your Own Business

work you are doing for him.

Many times it pays the service station manager to attend to the business of getting more customers and holding those he has so that it is advisable to buy the equipment needed. Sometimes however, a desire is felt to make the equipment express the individuality of the shop or perhaps make possible a slight saving so that service stations occasionally make their own equipment. Under these circumstances it is desirable to buy a driving motor with suitable speed control, also ammeter and voltmeter, cutouts, switches and wiring so that a good layout may be had.

For the benefit of those working on this plan the illustrations and circuits in this article may be helpful, for the bench should be such that generators with or without cutouts, also 6 volt or 12 volt machines can be handled, and without changing the wiring or going to a lot of trouble in rearranging connections. As it is quite an engineering problem to design circuits that will take care of all requirements we have done this work for the benefit of our subscribers and in addition have worked in a test which will locate grounds and is useful in some cases in making armature tests, although additional armature testing equipment is desirable for best results.

Fig. 1 shows the general appearance of a test bench suitable for the average shop. If desired it can of course be made longer with the extra length extending to the right and a vise and growler for armatures may be installed. Arbor press and small lathe would also go well in the electrical shop and might be put on the extension of the bench.

Operation of the Bench

The generator to be tested is first put in the clamping stand and wires from the terminals on the switch board are attached. The terminals are marked plus and minus but if the machine is of the grounded type, one of these goes to the frame of the machine.

If there is a cutout on the generator itself, then the cutouts on the bench will not be needed so that the cutout shorting switch should be closed. Then, if the machine is a 6 volt one,

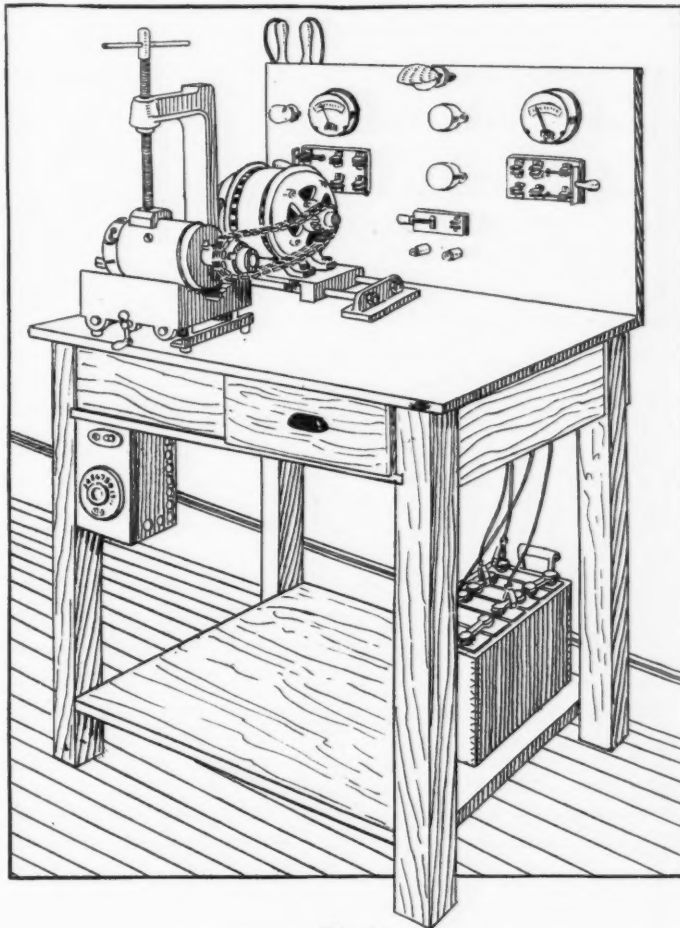


Fig. 1
A test bench for the electrical shop

the switch at the right is thrown to the right while if it is a 12 volt generator the switch is thrown to the left.

Closing the cutout on the machine will cause it to take current from the battery used in connection with the bench and run as a motor. In practically all cases it should then be driven in the same direction. About the only exceptions of which we know are old Gray and Davis generators built with a strong boosting series field. When these are run as motors they reverse the residual magnetism instead of forming it in the right direction. These are, however, hardly ever encountered at this time.

The Way the Cutouts Work

If there is no cutout on the machine, then it is desirable to use one on the bench, and by merely throwing the right hand switch to the proper position, the proper cutout will also be thrown into the circuit. Then if it is desirable to motor the generator it is only necessary to close the cutout shorting switch for an instant. When the driving motor is used to run the generator the proper cutout will function and connect the generator to the battery, the charging current showing up on the ammeter just as it would on the car.

The voltmeter shows the battery voltage and a rise in voltage will be seen when the generator starts to charge, the amount of rise depending on the battery condition. The 60

watt lamp at the upper center part of the switch board is intended to be provided with a green half shade so as to light up the bench. The 25 watt lamp at the left should be a red one, and is in circuit with the test points which are used in testing for grounds, also for locating circuits of unequal resistance as shorts in armatures.

The voltmeter, while normally showing the battery voltage, may be made to show the generator voltage only by leaving the right hand switch open, that is in the center position, while the generator is connected and driven with the center or cutout shorting switch closed. If the generator, for example will not cut in this makes it possible to determine exactly what voltage it is producing, whether it is .1 or .5 or whatever it may be. If the generator is normal this test must be made with care for at high speeds the 6 volt generator should develop perhaps 30 or 40 volts and might injure not only itself but the voltmeter.

The left hand switch is used in connection with the test points. When thrown to the left the test points may be touched together and the red lamp will light up on 110 volts. One test point may then be touched to an armature shaft and the other to the commutator to see if commutator or winding is grounded. The same test can be made on fields to see if they are grounded, making a connection to the field coil and the frame of the machine, first making sure that any intentional grounds are disconnected.

Low Voltage Test with the Test Points

When the left hand switch is thrown to the right we have the test points connected to one or two cells of the battery through the ammeter. If the right hand switch is in the 6 volt position we will have 2 volts acting and if it is thrown to the 12 volt side we will have 4 volts at our test points. With 2 volts at the points the resistance of the bench wiring is usually sufficient so that the points may be touched and the ammeter will only show about 25 amperes, although theoretically this is a short circuit.

Under these circumstances we can use the points on adjacent commutator bars and should get readings of perhaps

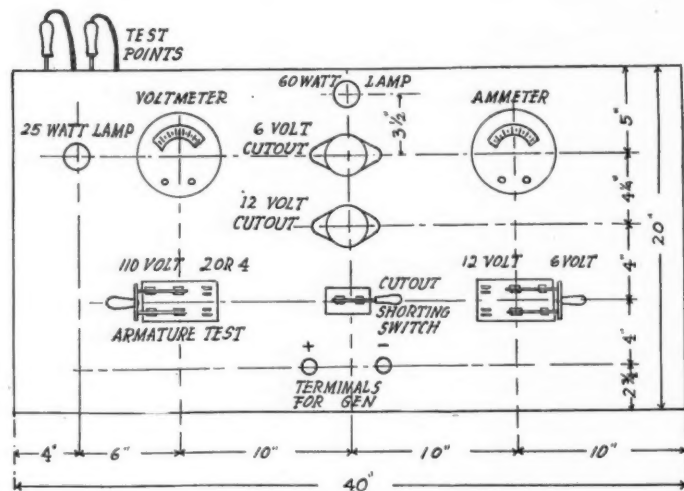


Fig. 2

Location of test bench instruments

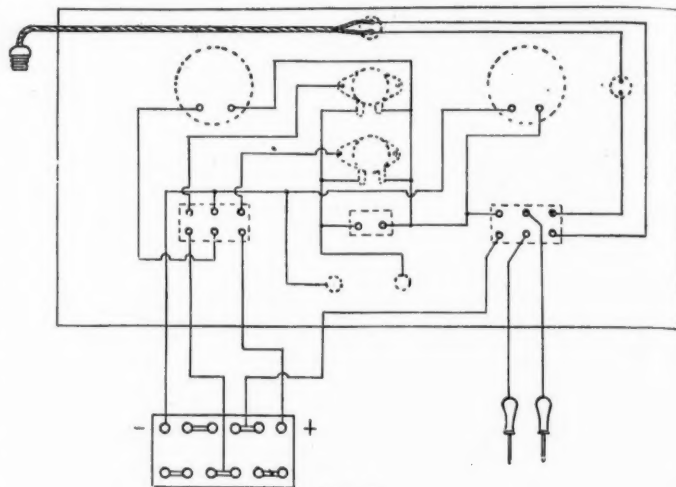


Fig. 3

Wiring of back of instrument board

15 amperes as the points are shifted from one pair of bars to another. With this test the same readings all around the commutator show that the armature is O. K. A very low reading indicates an open circuit and that the current has to travel through all the other coils in the armature. An unusually high reading on the other hand shows a short circuit.

These tests are not absolutely conclusive and can not be used with success on starting motor armatures on account of their very low resistance. It, however, serves as a valuable check on other methods of testing and may with care locate shorts and opens without the cooperation of other methods. Some variations, however, will be encountered even on a good armature on account of variations in manufacture.

While Fig. 1 shows the appearance of the bench, Fig. 2 shows the switch board layout and the approximate location of the various instruments. After the meters, cutouts, switches, terminals and sockets have been installed on the front of the board it may be turned over and wired. The wiring will then have to be as shown in Fig. 3.

This gives the appearance from the back so all you have to do is to wire it up the way it looks and it will do the things we have mentioned.

The main items of equipment needed are as follows:

- 1—driving motor with speed control
- 1—vise for holding generators
- 1—voltmeter 0-15 direct current
- 1—ammeter 30-0-30 direct current
- 1—6 volt cutout
- 1—12 volt cutout
- 2—lamp sockets
- 1—green glass half shade
- 2—binding posts
- 2—10 ampere double pole, double throw switches
- 1—10 ampere single pole, single throw switch
- 1—pair of test points
- 1—12 volt battery
- 1—plug for connecting to 110 volt socket. Approximately 50 ft. of No. 14 ignition cable for wiring up bench
- 6—15 ampere snap clips for connecting battery and making connections to generator.

WOODS HEADS HANOVER CO.

BUFFALO, N. Y., May 21—Clinton E. Woods, industrial engineer of Philadelphia, has accepted the presidency of the Hanover Motor Car Co. The Hanover company recently purchased the entire property and patent rights and effects of the defunct Parenti Motors corporation in Buffalo.

Woods expects to begin immediately on production of the Hanover car, and by the first of August expects to be in limited production of 25 cars a day.

DORT GIVES UP BRANCH

DETROIT, May 19—The Dort Motor Car Co., is discontinuing its Detroit branch and will hereafter distribute to its territory in this district through the Detroit-Franklin Co. A. J. Shaw, who was manager of the Dort branch, will be associated with the Franklin company, which is headed by E. G. Fuller, a veteran in Detroit automotive circles. Shaw will act as district manager for the Dort department of the new distributor.

N. A. C. C. MEETING JUNE 7

NEW YORK, May 21—The annual meeting of the National Automobile Chamber of Commerce will be held at New York headquarters Thursday, June 7, when directors will be chosen and the usual routine followed. A feature of the meeting will be a general discussion of gasoline taxes and the manufacturers will try to find out whether or not such taxes are desired by the industry.

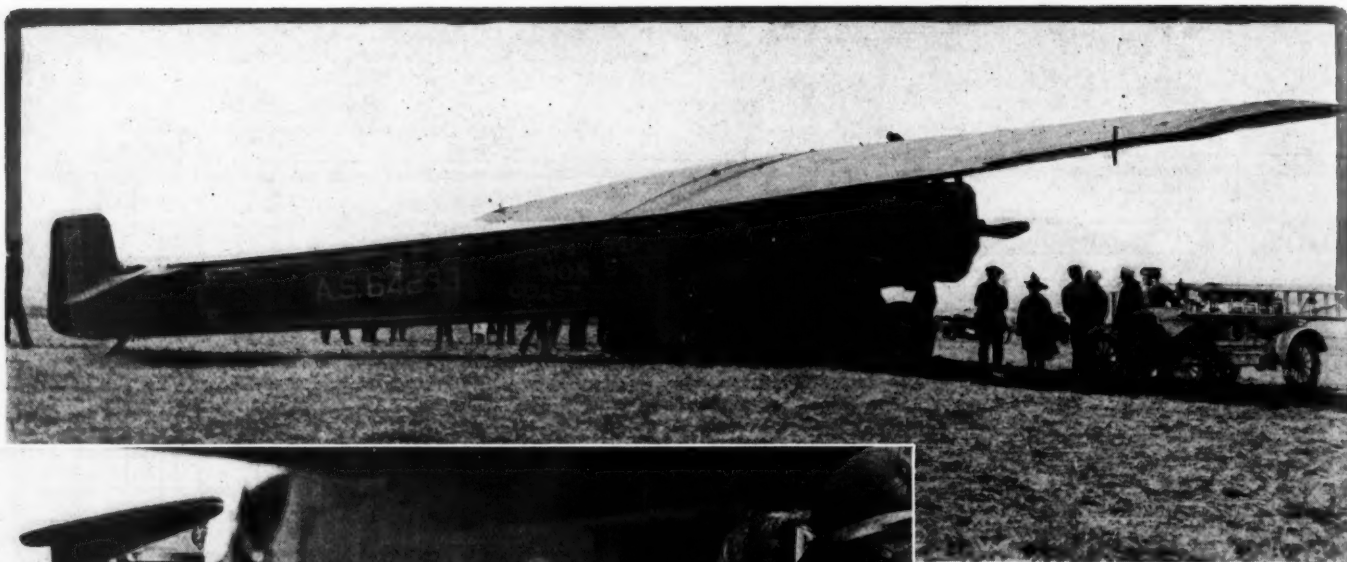
Is This Dealer Doing Business at 20 Per Cent Gross, or at Less than 11 Per Cent

		Gross	
		Sales	Loss Profit
Sale of new Car		150000	
Gross Profit @ 20%			30000
Cash for new Car	110000		
2 nd Hand Blank	40000		
Cost of Blank Car	40000		
Reconditioning	5000		
Total Cost of Blank	45000		
Sale of Blank Car			
Cash	17500		
2 nd Hand Blank	25000	42500	
Loss on Blank			2500
Cost of Blank Car	25000		
Sale of Blank Car			
Cash (note)	17500		
Orphan Car	7500	25000	
Cost of Orphan Car	7500		
Sale of Orphan for Junk		3500	
Loss on Orphan			4000
Losses on trades			6500
Gross profit			6500
Percent on new Car sale			15 2/3
Total Sales		2210	
Percent on complete Trans			10 5/8
x Dealer still holds note			

This tabulation of a motor car sale represents a leaf from a Wisconsin dealer's book. The amounts are not exactly correct, but relatively so. The dealer said that he was forced into the allowances made, but he was not clear as to who forced him. Do you know of any merchant who can conduct a retail business on 11 per cent gross profit and prosper?

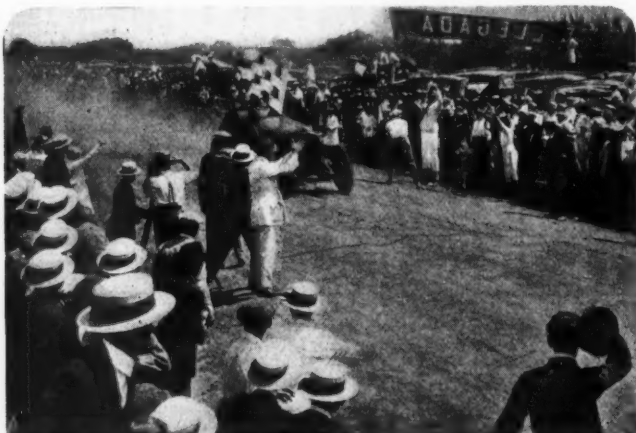
We take the position that the gross profit must apply to all sales, not merely the new car sale. If this gross profit is to be maintained, then there must be a gross profit made on each used car deal.

MOTOR AGE'S PICTURE PAGES



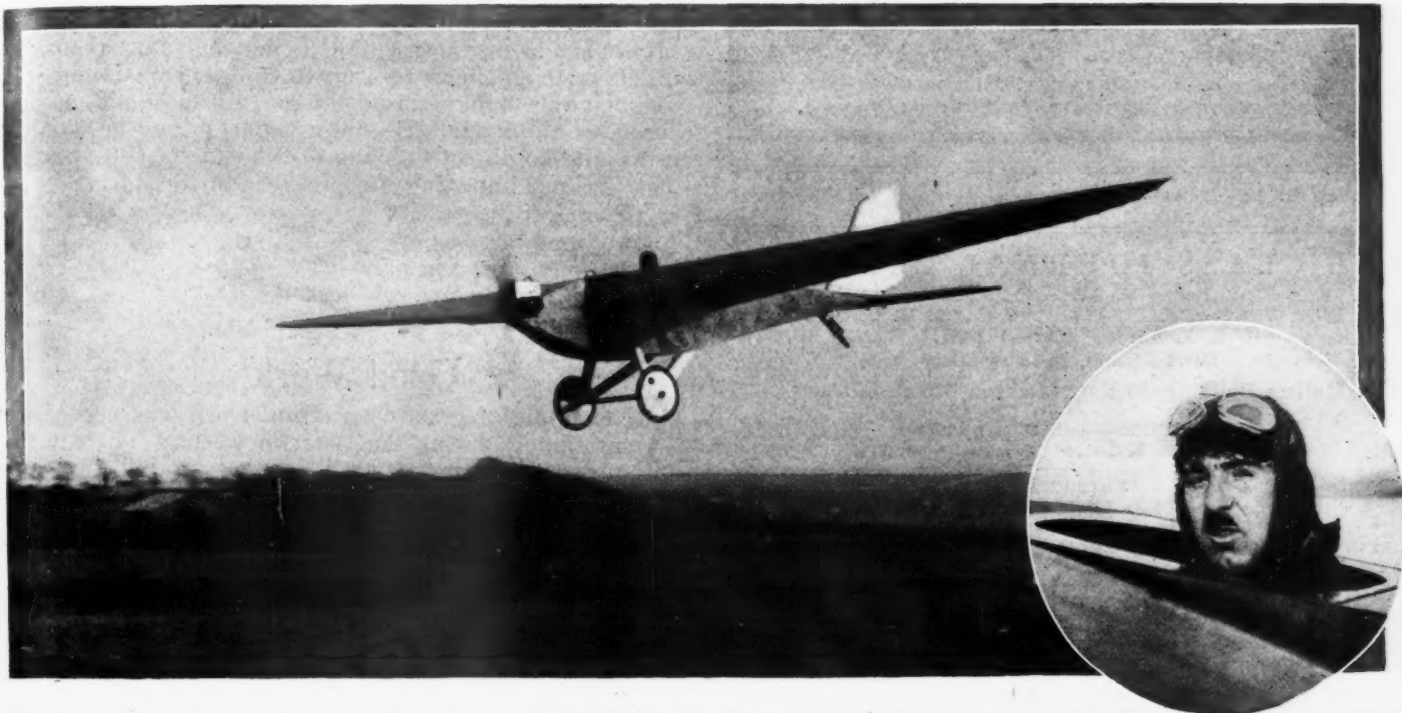
The T2 is what the Army Air Service calls a good long distance observation plane. The trip from New York to San Diego, California in 26 hours is a demonstration of the reliability of the Liberty aero engine. Full credit should be given to the construction of the plane itself and especially to the design of the wing section which for each square foot of wing area carries more than twice the useful load of each square foot of wing on the mail planes used by the Post Office Department at present

The coffee which the pilots are passing around here was made in New York twenty-six hours before. The transcontinental pilots, MacReady and Kelly, standing at the extreme right, jointly hold the world's record for duration and MacReady holds the altitude record



In the 1923 Gran Premio of Argentine, Studebaker has for the second time carried off the honors against a field including two foreign makes and six other American makes. This is the big road event of South America and is run from Buenos Aires to Rosario and return, about 470 miles. Only 10 of the 26 entrants finished, and four of these were Studebakers, but in spite of that a Lincoln took second place. The order of finish was: William T. Burke, Studebaker Special Six, 10 hr., 45 min., 35 sec.; Pedro Malgor, Lincoln, 10 hr., 47 min., 29 sec.; Paris Gianini, Studebaker Light Six, 10 hr., 48 min., 35 sec.; showing that the winners were running remarkably close. Burke is shown getting the checkers while Gianini is sitting in the stripped light six, after the race

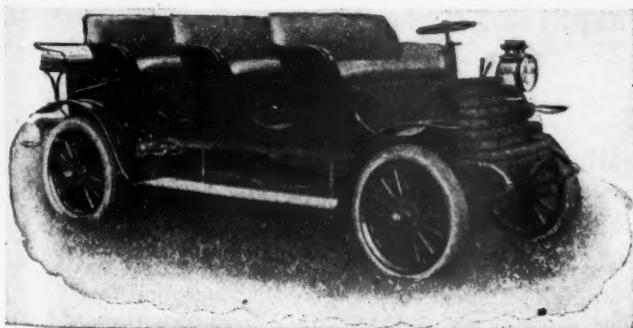
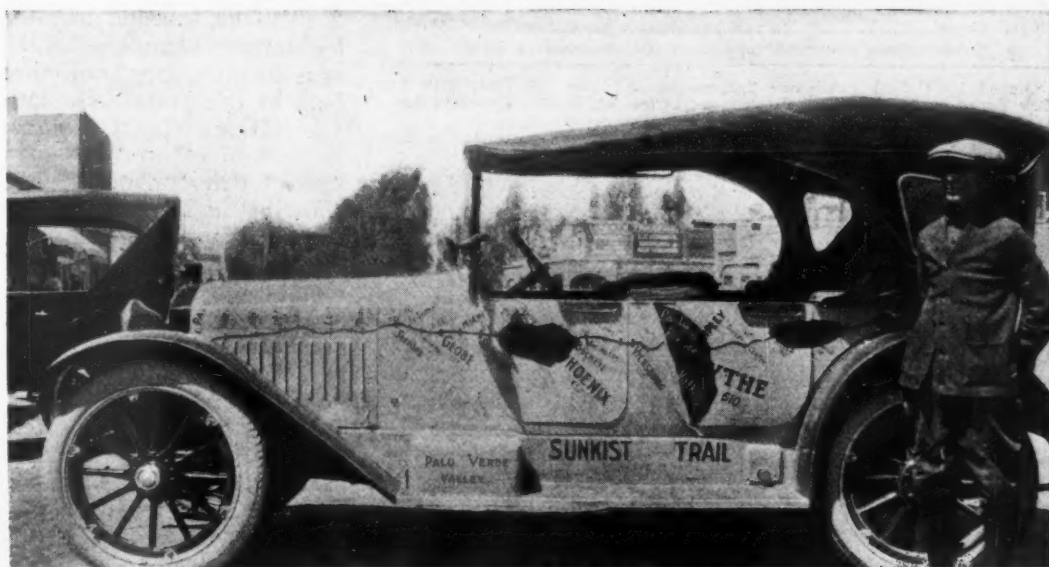
OF AUTOMOTIVE INTEREST



Exactly the same features that made the flight of the T2 possible underlie the successful flight of the French flivver plane. Note the stream line contour of the fuselage and note especially the similarity of this wing section to the wing of the T2. Only half of the 15 horsepower is required to fly this ship, the other half is reserve power for speed and climbing. M. Barbot flew this small edition across the English Channel on \$3.25 worth of gas but we don't know whether this is based on American prices or whether it allows for exchange rates



Realizing that the improved highway is the best salesman, not only for automotive vehicles, but for homes and farms as well, the Palo Verde Valley, California, is sending this car, in charge of L. S. Howe who stands beside it, to advertise the "Sunkist Trail"



This "Six Seated Gasmobile" was one of the classy models of "23 Years Ago"

Clifford M. Holland, the master engineer who planned the great vehicular tunnel under the Hudson River, is not particularly connected with the automotive industry but, if his engineering stunts can lessen the traffic congestion in New York, we are for him and wish there were more like him on the job in other parts of the country



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Words and Meanings

ONE of the troubles with the "flat rate" today is that so many men who are or should be for it, are standing off inquiring what a flat rate is or whether all dealers and factories are working out the details exactly alike. In fact the details are being made to confuse the big ideal.

Primarily the flat rate is a more or less appropriate name for an idea of selling maintenance to the car owner at a fixed or maximum price. The great objective is to keep the customer satisfied and to give to him a square deal. Just exactly what flat means, or what rate means, or by what detail A does it and why A's method differs from B's is not at all material.

If this question of detail is carried too far, some one will be suggesting pretty soon that some man's operation is not a flat rate because he uses a different make wheel puller than does his competitor.

Some argue as to what "flat" means. In this case it means exactly what it is intended to mean and what the dictionary says of the word has nothing to do with it. There was a time when "foul" was not used in baseball at all, because there was no baseball. Then came the baseball use of the word and now it is in the dictionary. The automotive industry is putting many words in the dictionary but it has not yet put "automotive" on these pages.

The thing to do now is to make a definition of the word by putting into practice this idea of selling the customer on the square, stopping quarrels and permitting the maintenance dealer to charge a sum that will bring him a reasonable profit.

If we are to insist on details being the same, then all will have to go back to Denver and Percy Chamberlain's flat rate book, and do things just as he did, as he originated the name. He did a good job and he would be the first to object to some of the rather silly discussions that are impeding the progress of this idea.



If you buy what you need when the price is right, you will own it right when you need it.



Good Work

AN example of good association work was recorded in Illinois during the last two weeks. There was proposed in the State Legislature a bill for the licensing of mechanics that held untold opportunities for mischief. Not only was it a prime revenue measure but it presumed to stop the owner of an automobile from changing spark plugs and tires on his machine.

The only persons permitted to work on automobiles were those who turned over to designated officials stated amounts of money and proved to the satisfaction of the tax collectors that they had worked on automobiles for three years or more. The dealer or distributor of an automobile was not permitted to have a voice in saying whether a man was competent to work on his automobiles, instead some tax collector would decide that for him.

The Illinois State Automobile Trade Association flashed the warning that this bill was to come before a legislative committee for a hearing. The request was sent to the entire trade, non-members as well as members of the State Association, to protest and for local associations to extend the call for protests. The calls to the non-members were specially written letters, sent as special delivery mail with a map of the entire state showing legislative districts and a complete roster of the members of the legislature. The Chicago Automobile Trade Association at once sent out a call to its members to act promptly.

The attack on the bill was backed by telegrams from numerous associations throughout the state and a number of association representatives gathered in Springfield to act in person.

If this bill is finally defeated, every dealer in the state will be indebted to the associations that took an active part in this fight. The indebtedness will be far greater than the dues to any association or to several associations. Associations are doing a great work for many a limping dealer.



"The sweetness of low prices never equals the bitterness of poor quality."



Associations

SOME associations do not take themselves seriously enough. The reason for a trade association is for protective and aggressive improvement of business. Some associations are active enough on the protective activities, but they lack much in the aggressive activities.

A sample of the aggressive activities is found in Brooklyn where the Service Association is promoting a sign that indicates a shop where service is sold according to proper standards, as vouched for by a committee of this

association. A well designed sign indicates this place and this sign is leased to shop proprietors whose shops are approved. The mere employment of members of the service men's association does not bring the right to the sign. It is a quality sign to put the gyp out of business, or at least to identify him by the fact that he cannot have this sign. All of the money paid by the dealers for their use of the sign is spent in newspaper advertising to promote the understanding of the sign.

The N. A. D. A. is organized on this quality basis and the idea is appealing to many dealers who were never interested in associations before. Every county or city association should look to the day when it can vouch for its members as the quality group and tell the world about it.



"Co-operation is the most effective factor of prosperity."



Knowledge Hungry

AT the meeting of the factory service managers last week some of the speakers indicated that in their opinion the small dealers, service managers and others who are connected with the automotive business are not students. It was indicated that many of them did not care to learn more about this business.

We are inclined to disagree with this assumption. We believe that the dealers of this country are knowledge hungry. It is true that a good many of them do not know how to study, as most of them are self made and self educated, and it is equally true that a good many factory-dealer contact men have not indicated to these dealers what and how they might study to learn about this business.

Last Monday the writer went to Hancock County to meet with the dealers of the county association. The weather was about as bad as can be imagined for this time of the year. There was a cold, steady rain and the tops of the earth roads were slipping off and motor cars skidded much like they do on a hard surface road after a sleet storm. Yet considerably more than half of the firms in that association were represented. Some of these dealers drove 40 miles to get to the meeting and had another 40 mile drive to reach their homes.

This situation is not unusual. Rather it is typical of the country association meetings. It indicates to the writer that these dealers are knowledge hungry and that the great need of the day is to give them directions as to how and where they can get the information that will help them. So many of these dealers are so new to the business that they do not know that MOTOR AGE and similar magazines are published to help them. It is a part of the duty, we believe, of all persons who have the welfare of the automobile dealers at heart to tell them at all times where they can get the information that will be helpful to them.



Motorists are not likely to buy accessories from slovenly shelves or showcases.



The Power Invisible

EVERY man in the automotive business owes his happiness and success to the good will of the community and the country at large and the feeling that motor cars are reliable and necessary.

In the field of aviation the opposite condition seems to hold at the present time, and lack of confidence on the part of the public is said to be the chief obstacle in the way of air craft development.

The automobile dealer would hesitate a while before deciding to take on a line of airplanes, but he takes on a reputable motor car without doubt as to his ability to succeed with it. There is a vital difference in the presence or lack of public confidence and the dealer is a big factor in building and maintaining such confidence.

The spirit of cooperation is a factor that as much as anything else is operating to inspire confidence in the minds of users of motor cars. Perhaps the large dealer is often imposed upon. His service manager may frequently give to the smaller shops and repair men in his vicinity information necessary to enable them to do their work right.

Selfishness would say, "Tell them nothing, then when the car goes bad, they will have to bring it here." But there is a reaction in that thought. Even if the car does get to the big shop in the course of time, the owner, probably disgusted with the service obtained, even when not the fault of the maker of the car or the authorized dealer, will decide to buy some other kind next time.

"Cast your bread upon the water," is not a proverb only, but a practical business maxim. You can not figure it in jobs, or dollars or orders, but the good you do over the phone or in the shop is a benefit to business in general and the good comes back to you in ways that you know not.



The man who offers nothing but price usually has nothing but price to offer.



Trading Advice

SINCE the used car problem has been a trouble of the dealers, they have frequently asked the manufacturers for advice and help. In the main the answer has been very sound, but rather unsatisfactory to the dealers. It has been "Buy 'em Right."

No one will contend for a moment that this is not good advice and if followed would be the longest step toward the solution of the used car difficulty. The man who buys his merchandise right will usually sell it right. The two go together.

But now the manufacturers are talking over an old trouble of their own and they are talking much to dealers about it. The dealers are quite ready with advice but the manufacturers are much in the same position as the dealer when it comes to accepting the used car advice. He thinks the dealer is talking too much in the abstract.

The dealer is saying to the manufacturer on the question of genuine parts "Sell 'em Right." And the manufacturer is wondering just what the dealer means.

"Sell 'em Right" means a lot more things than the manufacturer apparently thinks it does. It means a proper pricing of parts, quick filling of orders and an appreciation of orders, not an insolent acknowledgment in a form letter. It means correct filling of orders and advertising of merchandise. It means an identification mark on bearings and foundry pieces.

Proper merchandising of genuine parts at prices and with courtesy that would match that of the manufacturers of other quality parts would promote the parts business immensely.

April Production Boosted to 380,000

Revised Figures Considerably Higher Than First Estimate

Sales Continue Good and Rate of Output Is in Excess of That Last Month

NEW YORK, May 21—Revised figures place production of automobiles and motor trucks during April at 380,000 instead of 364,000, which was the conservative estimate announced at the close of the month. For the first four months of the year output reached 1,252,565, or more than double the production of 605,653 in the similar period a year ago. June of last year, with a total of 289,011, was the only month in the production history of the industry to approach April in output.

During the first week of May, for which reports are now available, production of cars was running five per cent above the first week of April, advices indicating, however, that output was in advance of shipments. This would point to some stocking of finished products by the manufacturers.

From all indications sales throughout the country are good, with the demand especially strong for closed cars. Such stocks as dealers have on hand are largely of open models, the accumulation being due in a measure to local climatic conditions.

It would not be surprising to find a slackening in manufacturing operations coming at almost any time owing to the desire of producers to bring schedules to a point where they would offer a regular operating program to be followed throughout the year. This would insure steady operations during the usually dull season. Such a paring off would not mean retarded sales as it would indicate the tendency of the industry against over-production. The industry as a whole has guarded itself against undue expansion of manufacturing facilities.

Caution is notably manifest in truck manufacture where parts releases are being authorized on the actual sales prospects in an effort to avoid the piling up of finished goods inventories. Truck demand continues in good volume, keeping pace with general business and industrial conditions. Farmers are buying well and commercial centers are increasing their purchases. The moving up of schedules is gradual, governed not only by the demand in the motor truck field itself but by the rapid development of motor bus and rail car use. The year will see a marked expansion in the truck branch of the industry.

Parts makers are maintaining their strong position because of the high operations followed in car and truck manufacture. Collections show little deviation from previous levels. Body builders continue on a capacity basis and are unable

to make deliveries. The heavy demand for the closed type of car has kept manufacturers operating at top speed, and so long as the demand continues there is no likelihood of any let-up in operations.

Details of Midland Steel Products Given by President

CLEVELAND, May 19—Details of the merging of the Parish & Bingham Corporation and the Detroit Pressed Steel Co., and the operation of both plants under a single corporation known as the Midland Steel Products Co., were given out here by E. J. Kulas, president of the company.

The general offices of the company will be in Cleveland at the plant of the Parish & Bingham Co. The Midland Steel Products Co. will be headed by E. J. Kulas as president, and the other officers will be: C. H. L. Flintermann, vice-president and general manager; Gordon W. Stoner, secretary, and R. H. Clarke, treasurer.

The Parish & Bingham plant in Cleveland and the Detroit Pressed Steel plant in Detroit will be operated. The combined plants have 27 acres of land and 607,661 square feet of floor space in buildings. Employees number in excess of 2,000. The principal business of the company is the manufacture of automobile frames and other heavy automobile stampings.

PERFEX COMPANY EXPANDS

RACINE, Wis., May 12—The Racine Radiator Co., which purchased the plant of the Perfex Radiator Co. at receiver's sale, April 21, went ahead immediately with production of Perfex replacement radiators for Ford and Chevrolet cars and regular equipment radiators for truck and industrial engine manufacturers.

Officers of the new company are: President and treasurer, Dr. D. T. McLeod; vice-president and general manager, F. M. Young; secretary, E. M. Alexander. Young had been with the original Perfex organization since 1919. He became general manager of the company about two years ago. The factory, which has 30,000 square feet of floor space, will be operated at full capacity, according to plans of the management.

RESTRICT GAS STATION LOCATIONS

FORT WAYNE, Ind., May 19—An interesting ordinance regulating the location of filling stations has been approved by the committee of the whole of the local city council and recommended for passage. This ordinance prohibits the location of drive-in gasoline and oil filling stations within 300 feet of a church, public or parochial school or a public park or within twenty-five feet of a residence.

J. Walter Drake Appointed as Assistant to Hoover

Automotive Industry Leader Takes Important Place in Department of Commerce

WASHINGTON, May 21—J. Walter Drake, chairman of the Foreign Trade Committee of the National Automobile Chamber of Commerce, chairman of the board of directors

of the Hupp Motor Corp., and vice-president of the Denby Motor Truck Co., has been appointed Assistant Secretary of Commerce by Secretary Hoover, of the Department of Commerce. Drake fills a place which has been vacant for several months and which has been temporarily filled by Stephen B. Davis, who is the regular departmental solicitor.

As yet Secretary Hoover has not announced the scope of Drake's work in the department but it is believed that because of his many qualifications that he will be placed in charge of the Commodity Division, for which his training has well fitted him. His manufacturing experiences, his knowledge of general business and his familiarity with exporting, as well as the fact that he is a lawyer by profession qualify him for this important post.

It is Hoover's aim to develop the general business side of the Department of Commerce and make it such a fountain of information that big business men will not hesitate to come to the Department for advice and consultation on business policies. With such a man as Drake to develop the Department along these lines, it is thought Hoover will bring this about.

Drake has been a most important factor in the automobile industry for years and his success with the Hupmobile has been most marked. As president of the company he brought it up into great prominence and about four years ago he became chairman of its board of directors, Charles D. Hastings assuming the presidency.

In the National Automobile Chamber of Commerce Drake has been a tower of strength, having been chairman of the Foreign Trade Committee since its inception in 1918. Always greatly interested in exporting, having sent a Hupmobile in a tour around the world as far back as 1912, he has made a close study of conditions abroad and has become an authority on the subject.



J. WALTER DRAKE

Haynes, Winton and Dorris in Merger

Pike's Peak Race Entries to Have Weight Limitations

A. A. A. Issues Table Giving Minimum Weights; Mercer Enters

COLORADO SPRINGS, May 21—The Annual Pike's Peak Race this year will witness the elimination of all cars weighing under 1600 pounds. This figure has been set as the minimum weight for cars with small piston displacement while the minimum for cars with heavier engines is 1800 and 2000 pounds.

Several entries have already been made, one being the Mercer which will be piloted again by W. S. Haines in the Labor Day scramble. The course is over some 12 miles of the Pikes Peak Highway. The following table of weights for the respective classifications is issued by the American Automobile Association:

Cars with a piston displacement of 183 cu. in. or under, 1600 lbs.

Cars of between 183 and 300 in. piston displacement, 1800 lbs.

Cars with more than 300 cu. in. piston displacement, 2000 lbs.

These weights are all exclusive of the weight of driver and mechanic.

EARL SPORT PHAETON OUT

JACKSON, Mich., May 21—A new Earl sport phaeton is now in production, selling at \$1275. It carries 5 passengers, has all nickel headlamps with dimmers, cowl parking lamps, signal tail lamp, two windshield wipers, Moto-Meter with ornamental radiator cap, double bar bumpers in front and rear, disk wheels and visor. A large size trunk is carried on the rear. The finish is in ultramarine blue, the upholstery being in genuine long grain glossy black leather with a special top to match.

TO MAKE 170,000 FORDS IN MAY

DETROIT, May 21—Ford Motor Co. output in May will aggregate 170,000, running 120,000 short of its demand from dealers which will total about 290,000. June production will be stepped up slightly higher, despite the fact that facilities at the main plants and at the assembly branches are already taxed. Requests from dealers for June will run about 305,000 the factory estimates from orders already received.

FIRESTONE QUILTS RUBBER ASSN.

WASHINGTON, May 19—Harvey S. Firestone, president of the Firestone Tire & Rubber Co., of Akron, Ohio, today announced his resignation as a member of the Rubber Association of America. His action is based, the statement reads, on the alleged use of common funds to oppose interest of rubber growers.

SUCCESS FOLLOWS CLEAN-UP

CHICAGO, May 14—The clean-up campaign for automotive merchants conducted the first week in May by the Automotive Equipment Association was a success even beyond expectation, according to Arthur R. Mogge, director of the merchandising department.

The 500,000 stickers printed to advertise the campaign were exhausted early and an additional printing was necessary to supply the demands of jobbers and manufacturers who wanted to use them on their mail. Hearty cooperation was reported from dealers' and jobbers' organizations throughout the country. As a result many reports were received of stores put into first class condition and stocks moved through the proper use of attractive and clean display.

George Fritz Becomes Vice President of Steidle Co.

CINCINNATI, O., May 21—Coincident with the expansion and incorporation of the Steidle Manufacturing Co., of Cincinnati, George Fritz, a veteran of broad experience in the automotive industry, has assumed the vice-presidency and sales management of the company.

Fritz's connection with the industry dates from 1903 and for a number of years he was active in trade association work within the industry. He was for a time field secretary of the Automotive Equipment Association and later was manager of the Research Club.

The Steidle company manufactures Atlas radiators for Ford cars, a product that has built the company up from a small basement shop to a three-story building in two years. Heretofore the company has been a partnership composed of Frank Steidle and Richmond J. Hollmeyer. Growth has made incorporation advisable and a charter has been granted, the authorized capitalization being \$150,000, most of which is paid in. Steidle is president of the company and Hollmeyer is secretary-treasurer.

LYMAN HEADS GEAR WORKS

RICHMOND, Ind., May 24—The Automotive Gear Works, Inc., of Richmond announces the appointment of W. H. Lyman as vice-president in charge of manufacturing. He assumed the office May 1. For the last 11 years Lyman had been general superintendent of the Warner Gear Co. of Muncie, Ind., and previous to that he was production manager of the American Locomotive Co. of Providence, R. I. Still earlier he was connected with the bicycle industry. The Automotive Gear Works recently moved here from Atlanta, Ga., and has greatly increased its manufacturing facilities.

OVERLAND PASSES 1000 A DAY

TOLEDO, May 21—Willys-Overland Co., established a new day's record of production when 1,026 cars were turned out at the factory on Tuesday, May 15.

Consolidated Motors to Be Name of New Corporation

Three Lines of Cars Would Be Continued to Cover Wide Price Range

KOKOMO, Ind., May 21—Formation of the Consolidated Motors to be composed of a merger of the Haynes Automobile Co. of Kokomo, with the Winton Co. of Cleveland and the Dorris Motor Car Co. of St. Louis, was announced here today. The new company will be capitalized at \$19,000,000, according to officials of the Haynes company, and application will be made to list its stock on the New York Stock Exchange.

Directors of the Haynes company have approved the merger and the proposition will be submitted to the stockholders, for approval which they are expected to grant, next Friday. It is understood here that the directorates of the other two companies also have approved the project and that their stockholders likewise will be asked to approve it.

The plan contemplates continued operation of all the factories of the three companies and the continuance of the three names in the automobile world. The plan of operation would be similar to that of General Motors, in this instance Consolidated Motors being the parent corporation with the three subsidiary companies producing their own distinctive lines of cars.

The plan, however, contemplated a readjustment of the types and price classifications of the three cars in order to form a well coordinated line of motor vehicles to meet the demands of buyers in all classes. The Dorris is to be the highest priced car in the group. The Winton would occupy a middle ground and the Haynes would constitute the popular priced model. It is the purpose to build a Haynes for around \$1000 and one for considerably less in order to participate in the low priced class.

OFFICERS ARE RE-ELECTED

PHILADELPHIA, May 19—The annual election of officers of the Philadelphia Automobile Trade Association resulted in the office-holders of last year being chosen in every instance. The officers are: Louis C. Block, president; Ralph W. Cook, vice-president; J. E. Gomery, treasurer and W. G. Herbert, secretary.

The directors, in addition to the foregoing, are: J. R. Pierpont, J. C. Roberts, L. S. Bowers, Walter Y. Anthony and James Sweeten, Jr.

This is the eighth year Block has been president of the organization, while Gomery has been treasurer for 10 successive years.

Charles C. Bulkeley was again selected as executive secretary.

Dealer's Fixed Price Contract Held Invalid

TOPEKA, Kan., May 19—The Supreme Court of Kansas has held invalid a distributor's contract with a tractor manufacturer because the contract fixed the price at which the distributor was to sell the tractors. The court declared such a provision was contrary to the state anti-monopoly law.

The distributor, Charles G. Mills, had a contract for the sale of tractors in a specific territory. He filed suit against the manufacturer, alleging that the manufacturer had made direct sales of tractors in that territory at prices lower than those named in the contract. The trial court held that his contract was illegal and denied his plea for damages. This decision was upheld by the State Supreme Court.

NASH OPENS BALL PARK

KENOSHA, Wis., May 18—The new baseball park and athletic field constructed by the Nash Motors Co. for its employes was opened this week. The park covers 10 acres and the entire project, including baseball diamond and grandstands, cost about \$150,000. The grandstand is built of steel and concrete and has 2,618 seats. There are also 2,000 bleacher seats. On the athletic field there is a club house divided into two sections, one for men and one for women, each section being equipped with lounge and kitchen. The field also has tennis courts, handball courts and a play ground for children.

FORT WORTH DEALERS ELECT

FORT WORTH, Tex., May 21—Officers have been elected by the Fort Worth Automotive Trades Association as follows: President, Ellis H. Boyd (re-elected); first vice president, John H. Homan (re-elected); second vice president, M. W. Boyle; secretary and treasurer, Harry Shedd; additional directors, Foster P. Jennings; Fred H. Jones, C. J. Bender and J. N. Whitehurst.

FACTORY CHECKS STOLEN

NEW YORK, May 19—A bulletin issued by the American Bankers' Association states that a book of blank checks has been stolen from the Chevrolet factory, the numbers being 11-2101 to 11-2150. The warning is issued so that the automobile industry may be on its guard in case anyone tries to cash checks of these numbers.

JUDGMENT AGAINST FACTORY

LOUISVILLE, Ky., May 19—A jury in Judge Thomas R. Gordon's court, on peremptory instruction, returned a verdict of \$35,000 for the Fisk Rubber Co. against the Kentucky Wagon Manufacturing Co. The suit was based on a purchase of tires. The verdict is subject to some credits of payments which had been made.

NEW ZENITH COMPANY

DETROIT, May 19—By unanimous vote of stockholders of Zenith Carburetor Co., all of its property except cash and bonds, has been sold for \$500,000 to the Zenith-Detroit Corp., composed of a group of minority stockholders of the former company. The new company has capitalization of \$250,000 and has taken over the property as a going concern, electing as its active officers the former officers of the Zenith Carburetor Co. The old company will be liquidated and receives in this sale sufficient money to pay in full all its indebtedness, and enough more to insure a liquidation dividend for its stockholders. The new company will have new and ample working capital furnished by the new stockholders, and old stockholders will be given opportunity to become subscribers to the capital stock of the new company.

CHANDLER PRICES INCREASED

CLEVELAND, May 21—With the exception of all but three models, the Chandler Motor Car Co., has advanced the prices of the Chandler cars \$90. The four passenger Metropolitan sedan, however, is increased only \$75, while the limousine and the two passenger roadster remain at the original figure. The following shows the old and the new prices which became effective May 7.

	Old Price	New Price
2-pass. roadster	\$1595	\$1595
4-pass. roadster	1595	1685
5-pass. phaeton	1395	1485
7-pass. phaeton	1545	1635
4-pass. sedan (Dispatch)	1695	1785
5-pass. sedan (Chummy)	1695	1785
4-pass. sedan (Metropolitan)	2195	2270
7-pass. sedan	2295	2385
Limousine	2995	2995

STERLING TRUCKS INCREASED

MILWAUKEE, May 19—The Sterling Motor Truck Co. has announced an advance in the price of its entire line of motor trucks; the increases vary from \$355 on the lighter models to \$500 on the heavier trucks. Both the old and new prices are shown below:

	Old Price	New Price
1½ ton	\$2885	\$3240
2 ton	3085	3440
2½ ton	3290	3700
3½ ton	4325	4750
5 ton (worm drive)	4950	5400
5 ton (chain drive)	5500	6000
7½ ton	6000	6500

An extra charge for the long wheel-base chassis on each model is made, and lists as follows: On the 1½, 2 and 2½ ton trucks \$50, 3½ ton \$75, and \$100 on the two 5 ton and the 7½ ton chassis.

CADILLAC SHIPMENTS GAIN

DETROIT, May 19—Shipments of cars from the factory of the Cadillac Motor Car Co., during April were more than 25 per cent greater than the best previous month the company has experienced. Deliveries of cars to owners throughout the country also eclipsed all previous monthly records, according to a statement by Lynn McNaughton, vice-president and general sales manager.

Oats for Old Dobbin Suffer Automotive Encroachment

WASHINGTON, May 19—Another casualty has been noted as a result of the increased demand for automobiles. This time the United States Government, through the Department of Agriculture, finds that "the advent and rapidly increasing use of motorized transfer and trucking in both the city and country are markedly reducing the commercial demand for feeding oats. The farm tractor also probably will reduce the number of work horses on the farm, thus further reducing the quantity of oats required. However, there still will remain a demand for oats by certain industries that will continue to use horses."

In the official Year Book of the Department of Agriculture issued this week, it is stated that "notwithstanding the rapid development of the farm tractor, a large percentage of the farms of the United States will continue to be tilled by the use of the horse as the chief source of motive power, and consequently oats will continue to be in demand as one of their principal feeds."

ANOTHER SPEEDWAY PROPOSED

PORTLAND, Ore., May 19—Construction of a board speedway along the lines of the speedways at Los Angeles, Fresno and other points, is being considered in Portland, as a result of conferences between Jack Prince, builder of speedways, and local race fans. Among those interested in construction of a speedway here are, Frank E. Watkins, Oregon representative on the race board of the American Automobile Association, and officials and members of the Automobile Dealers' Association of Portland.

MACHINE TOOL FIRMS MERGE

SPRINGFIELD, Mass., May 19—The Franklin Machine & Tool Co. and the Van Norman Machine Tool Co. have been consolidated under the name of the latter organization. The personnel of the Franklin company will be retained in the new organization and no change will be made in sales policies or design of what were formerly Franklin tools. The consolidation enables the Van Norman company to market a complete line of valve and piston-grinding machines.

SPEEDWAY MANAGERS ORGANIZE

NEW YORK, May 19—The National Board of Speedway Managers has been formed to co-operate with the Contest Board of the American Automobile Association in arranging non-conflicting racing dates and ironing out any difficulties which may arise among speedway organizations. The A. A. A. Contest Board however, still is in supreme control of the sport. A. M. Young, of Los Angeles is chairman of the new body.

Citroen Reveals His American Plans

Would Build 50,000 Cars First Year in U. S. Plant

If He Comes Over He Will Manu- facture Regular Citroen—Com- pares Factories with French

From the Paris Correspondent of MOTOR AGE

PARIS, May 8—(By mail)—"The \$2,000,000 worth of American machinery I have just ordered," said Andre Citroen, in an interview I had with him in his Paris office, immediately on his return from the United States, "will not only enable me to increase my output from 125 to 250 cars a day, but will make possible a reduction of 25 per cent on labor costs."

"As the result of my visit to the United States, I concluded that my factory was superior to the best in America in machining, assembly and body work, but that it was inferior in foundry work, forgings, stampings, enamelling and conveyor systems. The machinery I have ordered, and which will be erected under the supervision of the American engineers who came back with me, will wipe out this inferiority."

Citroen confirmed the report that he has under consideration the erection of an American factory. "When I return to America in six weeks' time, a decision will be taken," he said. "If it is decided to go ahead, I shall put on the American market my present type of Citroen automobile. These cars have been presented to the American public, and I know they will please. There is no need to make a special model for the American market. We have the advantage of lines, advanced technical experience, and considerably lower operating costs. The American public is prepared to consider the purchase of a car which costs less to run. With a Citroen we can guarantee to cut \$150 in average operating costs for one year compared with any other car of equal carrying capacity."

"If this scheme goes ahead, I shall lay plans for 80,000 cars and produce 50,000 the first year. We can sell this number right away. There is nothing difficult about the task. It represents 2 per cent of the total American output, whereas in France I am filling 45 per cent of the national output."

"The American automobile industry does not know how to advertise," Citroen continued, and he indicated that if he came on the American market he would show what could be done in this connection. "American publicity is feeble, it has no punch to it; it is lacking in point. I could show them something much better."

"There is no future in America for the Citroen-Kegresse system of flexible creeper track system of propulsion for at least another year. I took over with me the machines which crossed the

Sahara desert, and the American public was not interested, for it saw no immediate practical application in such a device. If the American factory scheme goes through, I shall send twenty of these machines to the United States next winter and give demonstrations of their utility under snow and other strenuous conditions. America needs to be educated to the use of this type of machine."

Citroen is of the opinion that fears of a saturation point in America are foolish. "The automobile industry in America is going to expand, and not merely for the next few years, but for a long number of years. In Europe too, we are an immense distance from the saturation point."

While bearing testimony to the immense development of the industry during the past few years, and while impressed with output, Citroen did not consider that American automobile factories were in every respect superior to those of Europe. "Compared with our best works," he said "the American factories are too crowded; aisles are congested to a point of inefficiency; there is too much artificial light. Approaches to the factories are often poor, and shipping facilities are not of the best. As an instance, I timed an electric conveyor in the Ford factory which was held up 10 minutes owing to congestion."

"Europe has a technical advantage over America, and it is inevitable in view of the handicap of big production which makes it difficult to change, even when the change has been shown to be an improvement. Front wheel brakes are just one example. We know they are right, while the American industry is only just beginning to inquire if there is anything in them."

Citroen is of the opinion that there is no need for European manufacturers to be afraid of the American industry, even on their home market. "Ford, of course, could put his car on the French market at 500 francs and not feel the loss, but that is not business, and it is an eventuality which need not be considered. Our labor charges are equal to those of America; our overhead charges are a little lower; raw material is three to four times more expensive, but if exchange returned to normal and import duties were removed the cost of raw material would be reduced, and we should still be able to compete with American cars on the European market."

HEIL'S 22ND ANNIVERSARY

MILWAUKEE, May 19—The Heil Co., manufacturer of tank and steel dump truck bodies and of hydro hoists, celebrated its twenty-second anniversary this month. The company was founded May 1, 1901, as the Heil Rail Joint Welding Co. with the development of the automobile it engaged in the building of welded compartment tanks and other specialized steel bodies for trucks. In 1919 it took over the Hydro Hoist Co.

New Car Sales in New York in April Exceeded 12,000

Registration in Metropolitan District for Four Months Totaled 27,497

NEW YORK, May 19—Registrations of new cars in the metropolitan district during April mounted beyond the 12,000 mark, and made extensive gains over the previous month and over April of a year ago, according to the Automobile Sales Analysis published by Sherlock & Arnold. For the four months of this year the registration totals 27,497 as against 21,074 for the corresponding period in 1922 and 11,510 for the four months in 1921.

Increase is noted in the high priced car field as well as in that of low and medium priced cars. In the former class, two cars are well in the lead, with sales for the four months in excess of 600, while three others top the 150 mark. The rest trail along under 100.

In the low and medium priced field, two cars are well in the lead for the year with sales above 4,000. The next three show sales above 1,500. Sales in excess of 500 are reported in five other makes.

Recapitulation for the four months is as follows:

	Medium and Low Priced	High Priced
January	2,814	201
February	2,801	580
March	8,102	769
April	11,124	1,106
Total	24,841	2,656

SALES GROW AT MOLINE, ILL.

MOLINE, Ill., May 15—Return of prosperity to this implement manufacturing center and the prospect of an increase in automobile prices has resulted in the heaviest spring buying in the history of local agencies. Sales during the first four months have passed the 1,000 mark and predictions are that 1923 will be the greatest business year in the history of the automobile industry.

Enclosed models are reported most favored by the majority of dealers but others claim that the demand has been evenly divided between the open and closed cars. Reports of sales indicate the following orders: Ford, 500; Chevrolet, 200; Velie, 33; Dodge, 30; Reo, 30; Buick, 29; Jewett, 26; Overland (month) 23; Stephens, 20; Nash, 14; Star, 14; Gardner, 11; Durant, 3.

DOBLE MOTORS PERSONNEL

SAN FRANCISCO, May 19—Doble Steam Motors announces that Arthur B. Domonoske is in charge of its large car, Arthur H. Lacey is in charge of the small car and R. A. Wilson is in charge of production.

Stutz Salesmen Compete to See the Indianapolis Race

Winners in Local Sales Contests Will Be Guests of Factory at Memorial Day Event

INDIANAPOLIS, May 18—A chart of the Indianapolis Speedway with miniature automobiles for markers forms the score board for the unique sales contest now drawing to a close in establishments of all Stutz distributors and dealers. The Stutz company has installed these score boards in all the dealer and distributor sales rooms and a master board is maintained at factory headquarters for determination of the winner of the grand prize.

The first place winner in each local contest will be invited to attend the Memorial day race as guest of the Stutz company and will be awarded a suitably engraved medal. Second place winners will be presented with engraved gold watches. The winner in the national Master Salesman's Contest will receive \$500 in cash in addition to his local prize.

In scoring the local contests, account is taken of sales only, each car of the Stutz series being given a definite point value in accordance with its price and relative saleability. The Speedway Four series, being higher priced than the six-cylinder cars, has a correspondingly higher point value. Similarly, roadsters count more than phaetons.

In the national sales contest extra

Stutz Salesmen Have Own Speedway Race



This is a photograph of the Speedway chart used by the Stutz company to record the standing of its salesmen in unique sales contest.

points are awarded for sales effort that is most closely in agreement with the national sales program outlined by the factory. Thus extra points are awarded for sales to present Stutz owners, for the submission of new selling ideas that are accepted by the factory, and for the best answers to factory prepared questionnaires that cover Stutz selling policies and Stutz mechanical construction.

Extra points are scored for consistency as demonstrated by regularity of sales, for sales that specify immediate delivery and for enclosed car sales. The contest closes May 19, no cars sold for

delivery after that date counting in the final compilation.

The prize winners will be guests of the Stutz company at a Master Salesmen's banquet the evening of May 29 at the close of the first day of the annual sales and service conference of the company. At this banquet presentation of \$500 to the national winner will be made by Charles M. Schwab, one of the directing heads of the company. Visiting Stutz dealers and distributors, as well as the prize winning salesmen, will see the race next day as guests of the company. The following day the sales and service conference will be continued.

Edwards Elected President of Birmingham Association

BIRMINGHAM, Ala., May 19—W. Sterling Edwards, of the Edwards Motor Co., Chevrolet dealers in Birmingham, was elected president of the Birmingham Automobile Dealers' Association at a meeting held recently, succeeding E. L. Scouten of the Scouten Motor Co. T. B. McCarty of the McCarty-Green Motor Co., Chandler and Cleveland dealers, was elected vice-president, and Pat Murphy of the Oldsmobile Co. of Alabama, treasurer.

The new board of directors is composed of E. L. Scouten, E. W. Brownell, H. E. Bissell, W. K. Dunwoody, T. E. McCarty, and W. S. Edwards, Jr.

The local association is affiliated with the state organization and the members were urged to get ready for the next meeting of that body to be held in Mobile during the month of July. From the statements of those present, Birmingham will have an exceptionally large attendance present when the meeting opens.

OPPOSE TRADE-INS

ROCK ISLAND, Ill., May 22—Vigorous action against the practice of taking used cars in partial payment for new ones was recommended to the newly organized Rock Island County Auto Trades Association at its organization meeting

this week by T. B. Beatty, Quincy association vice-president and Theodore Toline, Illinois State Association president.

Prediction was made that rigorous steps to curb this practice will be among the first acts of the new body. A paid secretary and manager will be employed and directors are interviewing prospects. Permanent officers have been chosen as follows: President, H. E. Allen, Rock Island; vice-president, L. F. Haemer, East Moline; treasurer, R. C. Jasper, Moline.

The membership is 37 but Beatty is assisting Dean, Bushong and C. C. Carter in a drive to enroll every dealer in the county.

TRUCK PLANS LOST

EAST MOLINE, Ill., May 24—Pattern and plans for a one-ton truck being developed by the Moline Plow Co. were lost in a fire which last week destroyed the experimental building of the truck works at First street in this city. Machinery and equipment in the one-story plant were destroyed with loss of \$10,000. Sparks from an engine ignited grass along the tracks and the fire sweeping over a 20 acre area reached the building before it was stopped. Destruction of the ton truck plans and patterns wiped out the work of many months.

To Make Motoring Easy by Naming or Numbering Roads

HARRISBURG, Pa., May 19—Gov. Pinchot has signed the Jones bill which empowers the State Highway Department to designate certain highways and groups of highways by name or special number. This is designed to make for easier motor travel, for tourists will be able to identify the various routes by numbers or names, just as they do city streets.

It is believed that this new law will do more for the simplification of touring than anything ever before attempted. With the roads named or numbered, they will be able to secure explicit directions that will enable them to find the desired routes without much trouble. No longer will they be told vaguely to take the second turn to the right. Instead they will be informed that No. 2 route, which will be so marked, is the one they want

BIJUR PLANT TO BE SOLD

NEW YORK, May 19—John Milton, temporary receiver of the Bijur Motor Appliance Co., of Hoboken, N. J., has been discharged, the court order vacated and announcement is made that all the assets of the company will be sold at public auction by Joseph P. Day, June 18 at the plant in Hoboken. The assets include only the plant, machinery and tools but also the patent and patent rights, trade marks and trade names.

Durant Tells Stockholders About Various Enterprises

Head of Corporation Lists Holdings and Describes Relationship of Component Companies

NEW YORK, May 19—In connection with the financial statement of Durant Motors, Inc., issued last week, summary of which was printed in *MOTOR AGE* of May 10, W. C. Durant described for the stockholders the complete holdings of the corporation. Of the various enterprises enrolled under the Durant banner there are four which are wholly owned by Durant Motors. These are the Durant Motor Co. of New Jersey, the American Plate Glass Co.; Motor Parts Corporation and the Locomobile Co. of America. In the others Durant Motors receives a percentage of the net profits.

Durant describes the corporations' holdings as follows:

At Elizabeth, N. J., we have one of the largest and best equipped plants in the country (purchased from the receivers of the Willys Corp. for \$5,525,000) owned and operated by the Durant Motor Co. of New Jersey, employing a capital of \$13,000,000; capacity, 600 cars per day, or 150,000 cars per year; product, Durant and Star cars. All the stock of this company is owned by Durant Motors, Inc.

At Lansing, Mich., we have a thoroughly equipped plant, complete in every detail, owned and operated by the Durant Motor Co. of Michigan, employing a capital of \$6,000,000; capacity, 500 cars per day, or 125,000 cars a year; product, Durant and Star cars. The company is supervised and managed by Durant Motors, Inc., which receives for varied services 60 per cent of the net profits.

At Oakland, Cal., we have a modern plant, complete in every detail and operated by the Durant Motor Co. of California, employing a capital of \$5,000,000; capacity, 200 cars a day or 50,000 cars per year; product, Durant and Star cars. This company is supervised and managed by Durant Motors, Inc., which receives for varied services 60 per cent of the net profits.

At Toronto (Leaside) Canada, we have a thoroughly equipped plant, complete in every detail, owned and operated by Durant Motors of Canada, Limited, employing a capital of \$4,000,000; capacity, 160 cars per day or 40,000 cars per year; product, Durant and Star cars. This company is supervised and managed by Durant Motors, Inc., which receives for varied services a percentage of the net profits.

At Muncie, Ind., we have a large and well arranged plant, especially adapted to the manufacture of high grade cars, owned and operated by the Durant Motor Co. of Indiana, employing a capital of \$4,000,000; capacity, 60 cars per day or 15,000 cars per year; product, Durant Six and Princeton cars. This company is supervised and managed by Durant Motors, Inc., which receives for varied services 60 per cent of the net profits.

To insure a dependable source of supply of plate glass, your company has acquired the entire capital stock of the American Plate Glass Co., of Kane, Pa. The plant, one of the best organized and equipped in the country, with a capacity of 5,000,000 sq. ft. of plate glass per year, is from every standpoint a most valuable acquisition. The entire capital stock is owned by Durant Motors, Inc.

A consolidation of the New Process Gear Co. of Syracuse, N. Y., Adams Axle Co., of Findlay, O., and Warner Corp. of Muncie, Ind., is known as the Motor Parts Corp. This company is an important source of supply for differential gears,

axles, steering gears and transmissions, and is being developed to handle our requirements for these essential items. The entire capital stock of this corporation is owned by Durant Motors, Inc.

The organization of Durant Motors, Ltd., of London, England, with a capital of 200,000 pounds (\$900,000) owned and managed by experienced motor car merchants, controlling the sale of Durant products in the British Isles, has been perfected and is in successful operation. Under the terms of the contract, after the dividend on the preference shares has been provided for, Durant Motors, Inc., receives 50 per cent of the net profits.

The Locomobile Co. of America is an operating and holding company, with its main plant at Bridgeport, Conn., manufacturing the Locomobile. In addition it owns and operates its plant at Long Island City, manufacturing the Flint car. It controls by contract the supervision and management of the Flint Motor Co., of Flint, Mich., receiving for varied services 60 per cent of the net profits. It controls by stock ownership the supervision and management of the Mason Motor Truck Co., of Flint, Mich. Against all of its properties and equities the Locomobile Co. of America has issued 600,000 shares of no par value common stock, all of which is owned by Durant Motors, Inc.

In addition to the above, Durant Motors, Inc. has a contract to manufacture for and supply Star Motors, Inc., with all Star cars used by it for a period of 20 years, receiving in lieu of a fixed manufacturing profit, a percentage of the profits resulting from distribution. This contract is valued at \$20,988,000.

The corporation also has a contract with the Hayes-Hunt Corp. which, for no consideration other than a contract to purchase certain types of closed bodies, gives to it a percentage of the profits as earned, payable in stock. This contract is valued at \$2,500,000.

Figures Ford's Profit at \$55 Per Car

NEW YORK, May 24—An analysis of the financial statement filed in Massachusetts by the Ford Motor Co., made by the Wall Street Journal, has resulted in the estimate that Ford makes a profit of \$55 per car. The gross profit is figured at \$77, but allowance is made for depreciation and other reserves. In addition, there is figured a profit on parts amounting to \$13 for every car sold, leaving a net manufacturing profit of \$64 for every car sold.

At \$55 per car profit the total net profits amounted to \$84,348,605 on the 1,533,611 motor vehicles built by Ford in the year ending Feb. 28, 1923, while the profit from the sale of parts amounted to \$19,936,943.

OLD TIRES FOR PAVING

RACINE, Wis., May 21—One of the broadest channels yet evolved for the use of wornout motor car casings is claimed to have been devised by Wright Rubber Products Co., which after two years of experimentation has turned out a composition rubber paving block along with rubber flooring blocks and sections, the original line. A specimen installation of the new paving block is about to be made at the Main street crossing of the Milwaukee Road in Racine.

Golf—Well, Probably They Have Earned a Day or Two Off

Those Baltimore Dealers Seem to Be Rather Proud of Their Ability to Swing the Club

BALTIMORE, Md., May 19—Members of the Baltimore Automobile Trade Association are planning to forget business for a day and engage in what promises to be a wonderful golf match. They will journey to the links of the Maryland Country Club on Monday and play around in the morning and then take lunch. Another round is planned for the afternoon. Those in charge are busy making up the schedules for the games.

Baltimore automobile men won the high honors in the first round of the Inter-City Automobile Golf Tournament recently. The team which won these honors was composed of A. H. Bishop, E. T. Backus, A. D. L'Esperance, Theodore Thomas, Howard Ford, A. J. Hunter, Robert G. Worthington and Roland M. Long.

Now comes the Baltimore Automobile Trade Association Tournament open championship.

"Every member is expected to play," says the notice sent out by the Association. "Regardless as to whether you have ever played golf before now is the time to play in a tournament. Members who have never played golf will be given a handicap which will put them in the running. The good golfers will be given no handicap. It will be plenty of fun and exercise for everyone and everyone will have a chance at the many prizes that will be offered.

"The Association will be glad to receive gifts from its members which will be awarded as prizes. No closed cars will be accepted as prizes, but if any member wants to donate a tire or tube, or a few spark plugs or old clothes, send them to Association quarters. The association will donate first and second prize and a booby prize for high gross."

The committee consists of E. T. Backus, A. J. Hunter and R. M. Long.

100 Per Cent Increase in Sales in Canadian Provinces

WINNIPEG, May 23—One hundred per cent increase in business done in the three prairie provinces of Western Canada (Manitoba, Saskatchewan and Alberta), is reported by the Ford Motor Company of Canada. Last year, during the first three months, 1189 cars were assembled in the Ford plant at Winnipeg for distribution in the prairie provinces. During the same period this year the total was 2360. The payroll for the three months in 1922 was \$45,359 as against \$65,941 for the first quarter of 1923.

The figures supplied by J. H. Irwin, branch sales manager for the Ford company in Winnipeg, show that Western Canada is coming back strong in automotive prosperity.

Department of Agriculture Pays Tribute to Motor Vehicles as Aid to Farmers

Cites Use of Trucks in Helping in Collection and Distribution of Milk and in Marketing Live Stock

WASHINGTON, May 19—High tribute is paid to the efficiency of motor transportation in developing the dairy and live stock industries, in the Year Book of the United States Department of Agriculture, published here this week. It is significant to note that the official report says "the value of highway transportation as a means of marketing milk can not be adequately measured in terms of money. It is essential to the furnishing of a necessity of life to many millions of people and as such is beyond any accurate measure of value that can be devised. Every improvement in the highway itself or in the vehicle used for transportation results not only in a great saving due to reduction of marketing costs but also in supplying more and better milk to the millions of people living in the larger cities."

Furthermore, the Year Book points out that "the development of motor truck transportation offers an additional distinct advantage in many localities to both the dairymen in the country and the milk distributor or manufacturer of dairy products in the city. When railroads were the sole means of transportation, there was hauling from the farm to the shipping station, and again from the city railroad station to the city plant. It is now common for the truck from the city plant to call at the farmer's gate. Not only is the farmer's time available for other purposes but the terminal charges and delays are also eliminated."

"To the farmer and dairyman improved highways and motor transportation have meant not only a lower marketing cost for milk, but also the extension of the possible marketing area. The experience of eastern dairymen has shown that with the use of trucks the average distance to market can be increased considerably, because the farmer is now in a position to take advantage of markets which in the past were often restricted to small groups in favorable locations."

"Before the advent of the motor truck and good roads," the Government report states, "it was necessary with horse-drawn equipment and unimproved highways to use rail transportation for distances over several miles. However, this range has not been considerably increased."

Cost figures for milk collection around Kansas City and Minneapolis show that for a 30 mile haul the rate for shipment by truck is less than one-half the cost of rail shipments plus the cost of bringing milk to the railway station and delivering it from the station to the milk distributor. Similar figures for Detroit show that at the present time a dairyman 60 miles from the city can ship by truck for approximately the same rate as that charged by the railroads.

"On longer hauls the cost of collection are secondary in importance to the time required for collection and to the condition of the milk on arrival. A case is cited from California where it was found profitable to ship milk 134 miles by truck on account of the better condition of the product on arrival. The greatest difficulties of long-distance milk transportation lie in spoilage due to overheating and churning in transit, caused by hot weather and continued jolting over the road. It has been found that the use of insulated tanks mounted on trucks has to some extent eliminated these difficulties. These tank trucks are quite widely used at the present time. Churning is prevented when the tanks are loaded to capacity, and experiments have shown that on trips on hot days the rise in temperature is usually less than 1 degree F. per hour."

The Government says that "partly because of difficulty in obtaining adequate and satisfactory rail transportation but more particularly as a natural evolution of transportation, the motor truck has, during the past few years, come to play an important part in getting hogs from the farm to the market. At many of the important live-stock markets fleets of motor trucks, some trucks capable of holding half a carload of hogs, are in operation daily. Many of these trucks run on regular schedule and cover a radius of from 50 to 75 miles on all sides of the market. These motor trucks have been particularly serviceable to the small-lot producer living at a considerable distance from a railroad. They have also rendered valiant service at various times when rail transportation was interrupted or curtailed by storms, strikes, or other untoward events."

Every Member Get a Member Campaign Is Success Here

HARRISBURG, Pa., May 19—A recent bulletin of the Pennsylvania Automotive Association lists 29 members who have obtained from one to 19 new members

each in the "Every Member Get a Member" campaign. During the session of the Legislature, Secretary-Manager R. C. Duffus is effectively using bulletins to keep the membership informed of the status of all bills affecting the automotive industry.

Chicago Used Car Dealers Organize; Membership Is 20

Meyer and Schaedel Lead New Association For Better Merchandising

CHICAGO, May 19—Exclusive used car dealers in Chicago have organized the Chicago Used Car Dealers' Association with a membership to begin with of about 20 firms. These firms are engaged chiefly in the business of buying used cars from new dealers and elsewhere and retailing them to the public.

Officers were elected as follows: President, Eddie Meyer; vice president, Edward Schaedel; secretary, Edgar Fitzpatrick; treasurer, H. M. Robinson. Additional members of the executive committee are Robert Stecham, Charles Moss, Frank Shapiro and Harry Fells. Meetings will be held once a month.

The purposes and objects of the association, set forth in the constitution, include the following:

"To promote a feeling of confidence, good fellowship and good will with each other and with the public."

"To reduce the cost of automobile accessories, painting, insurance, etc., by group buying."

"To employ an attorney to protect at all times the legal interests of the members."

"To eliminate the necessity of used car dealers bidding against each other and being played against each other by the new car dealers."

"To adopt as closely as possible a basis of used car values to be used by the members of this association in the purchase of used cars for resale."

"To have passed by the legislature a bill that will necessitate the licensing and bonding of all used car dealers, thereby eliminating unscrupulous and curb dealers from the ranks of the used car profession."

"To organize and maintain, if possible in the future, a central service department whereby buyers of used cars can obtain a 12-months' service on all purchases made from members of this association."

"To use the multiple listing system of cars in each office of the members of this association so that the members can sell cars for other members if the customer does not find what he wants in the office in which he happens to be."

A group advertising campaign will be instituted by the association to acquaint the public through the newspapers with the objects of the association.

ADVANCE CO. OPENS NEW PLANT

CHICAGO, May 19—The Advance Automobile Accessories Corp. of Chicago, manufacturer of brake linings, timers, shock absorbers and other products, has started production in its new metal parts factory at Homewood, a suburb of Chicago. The executive offices of the company are at 1721 Prairie avenue, Chicago.

General Motors Acceptance Corp. Finances Many Sales

Fourth Anniversary Shows That Over Half a Million Sales Were Aided

NEW YORK, May 19—Completing its fourth anniversary with the ending of the first quarter of 1923, the General Motors Acceptance Corp. has compiled figures showing that in the four years it has financed the buying of more than a half million automobiles, involving \$348,431,401.

The figures for the entire period show that in the nine months the corporation was operating in 1919, 25,635 cars were financed; 108,436 in 1920; 97,396 in 1921; 208,091 in 1922 and 82,408 in the first three months of this year.

General Motors dealers in supplementing their personal resources and their bank credits have called on the corporation for \$348,431,401 divided as follows: 1919 (nine months) \$17,624,795.49; 1920, \$83,401,256.94; 1921, \$72,531,387.27; 1922, \$125,048,589.57; 1923 (three months) \$49,825,372.48.

These figures refer only to the financing of General Motors automobiles and do not take into consideration other General Motors products which are financed by the corporation.

Smith Co. to Have Building for Their Pressed Steel Frames

MILWAUKEE, Wis., May 21—The A. O. Smith Corp. will soon have ready for use a unique storage building capable of holding 60,000 pressed steel frames, with special equipment for receiving, handling and shipping, which cuts down labor and expense to an absolute minimum. The design of the building and equipment have been patented by the designers and builders. The Smith company also is completing a new frame shop with three special machines capable of producing 3600 frames in a 10-hour day with the labor of only 180 men, compared with a former capacity of 3000 frames with the labor of nearly 2000 men. The shop is now laid out so that plain sheets are received at one end and pass through a series of presses, punches and drills, coming out in finished form at the other end, to which is connected the new patented storage building, which discharges into the shipping building.

LIBERTY SALE AGAIN SET

DETROIT, May 19—Sale of the Liberty Motor Car Co. under an amended order of sale has been set for June 14 at 12 noon at the plant, with no upset price stipulated. The terms of the sale, with the exception of the withdrawal of the former upset price of \$1,175,000, are about the same as under the former order, according to the Security Trust Co., receiver.

The property will be offered as an

entirety and in two parcels made up of the real estate as one and personal property the other. Bids will also be received on the real estate subject to taxes, and under other forms still under consideration by representatives of interests involved.

Ford Reopens Cleveland, Denver and Portland Plants

DETROIT, May 19—Ford Motor Co. has reopened three former assembly branches to meet increased demand for cars which it has been unable to meet with its regular assembly organization. The reopened plants are at Cleveland, Denver and Portland, Ore., all of which have been re-equipped to meet modern production requirements. In addition, the company has also made new installations at several of its regular branches to increase output.

As reopened, the Cleveland plant which has been unused for production since 1918, will have capacity for 150 cars a day. Denver will produce 150 cars daily and the Portland branch, 50.

INDICTED FOR STOCK SALE

PITTSBURGH, May 19—The Federal grand jury has returned an indictment against Frank E. McClintock, R. R. Starnes, Duncan McDonald and Paul Moscou, charging them with using the mails in a scheme to defraud and conspiracy in connection with the sale of stock in the Gearless Motor Corp. The action involves sale of stock for \$1,114,000 to many purchasers in Western Pennsylvania, West Virginia and Ohio, according to Post Office Inspector George V. Craighead.

The defendants, according to the indictment, organized the Gearless Motor Corp., under the laws of Delaware, Feb. 15, 1918, with an authorized capital stock of \$2,000,000, divided into 88,000 shares with a par value of \$25 for the purpose of taking over the alleged assets and property of the Gearless Motor Car Co., organized Dec. 6, 1918, with a capital of \$50,000.

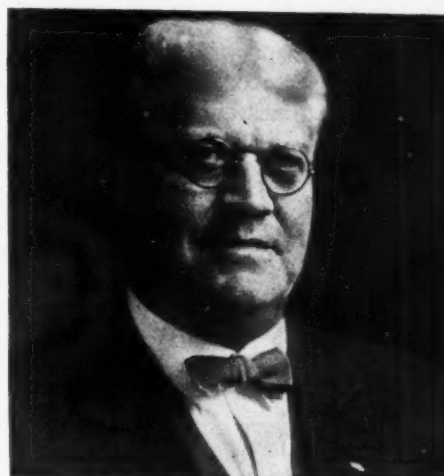
NEW CHICAGO TRAFFIC PLAN

CHICAGO, May 19—The installation of Chicago's first synchronized traffic control system is under way. This system of towers will be erected in Michigan boulevard from Randolph street south, with a master tower at Jackson boulevard. This system, to cost about \$30,000, is being installed at the expense of the Yellow Cab Co., with the understanding that if it proves successful the city will pay for it. If it is not successful the cab company will remove it at its own expense.

MCQUAY-NORRIS EXPORT OFFICE

ST. LOUIS, May 21—The McQuay-Norris Mfg. Co., makers of piston rings, piston and piston pins, has established an export office at 30 Water street, New York City, under the direction of W. D. Blood.

Dealer Is Elected to St. Louis Board of Education



H. F. FAHRENKROG

ST. LOUIS, May 19—A dinner to H. F. Fahrenkrog, president of the St. Louis Automobile Dealers' Assn., will be given by his associates to celebrate fittingly his election to the St. Louis Board of Education.

Mayor Kiel, Henry A. Roskopf, president of the Board of Aldermen; John J. Maddox, superintendent of schools, and others are on the list of speakers.

Fahrenkrog has been prominent in the automobile dealers' association for many years and was elected a director six times, served as vice-president one term, was elected president and then re-elected president last year.

He is one of the pioneers in the automobile business in St. Louis and has long been regarded as a stickler for ethics. He has done much for the advancement of the industry and other members regard his election to the Board of Education as proof that the automobile business has taken its proper place in the life of the community.

Fahrenkrog was born in Bunker Hill, Ill., 51 years ago and started life as clerk in the small town when 15 years old. He later became a traveling salesman and since 1906 has been connected with the automobile business, first with Kardell Brothers.

Tires Consume Four-Fifths of All Crude Rubber in U. S.

NEW YORK, May 17—Manufacturers of tires and tire sundries consumed 161,959,045 pounds of crude rubber in making \$156,908,226 worth of finished products in the first quarter of 1923, according to an announcement made by the Rubber Association of America, which compiled the figures.

As showing the predominance of the tire manufacturers, they consumed 83 per cent of the total of 195,097,797 pounds of crude rubber used in the quarter and the value of their sales was 67 per cent of the grand total of \$235,660,349 for the entire industry.

"Dealer as Good as a Government Bond"

This Is the Aim of Dodge Bros., According to Statement

Pamphlet Addressed to Bankers Pictures Company's Retailers as Sound Credit Risks

DETROIT, May 19—Dodge Brothers has issued a pamphlet entitled "The Assets of A. Dodge Bros.' dealer in Banking Terms," which in an explanatory note by President F. J. Haynes, is declared "prompted by the desire to give the banker a true picture of Dodge Brothers endeavor to build for better business, and perhaps thereby, help the Dodge Bros. dealer whose fortune Dodge Bros. realize is most closely and inseparably linked with theirs, to be better understood and appreciated."

The opening chapter tells of the foundation of the company by John and Horace Dodge, its growth from a humble machine shop in 1901, to one of the largest parts making plants in the United States in 1914, and its embarkment that year into automobile manufacturing. Since that year 900,000 Dodge cars have been built. The desire to merit good will, because of value given, is stronger than ever, it is stated.

Regarding its dealer organization, the pamphlet relates the selection was made from 22,000 applicants. The determining factors were adequate financial strength, sound business experience, a reputation for honesty and straightforward dealing. In no case was there any compromise on these essentials. Dealers recognize that Dodge Bros. policy is intended to be constructive and just says the pamphlet, and having a constructive policy, Dodge Bros. never discard a dealer until time has demonstrated that the dealer cannot be brought up to, or will not of his own accord come up to, Dodge Bros' standard.

Urged Close Relations

"It is significant," the booklet says, "that from the first Dodge Bros. urged their dealers to establish the most close and confidential relations with their bankers, urging them to be frank, honest and above board in all their dealings. This has contributed materially to the high esteem in which the average Dodge Bros. dealer is held by his banker. Everywhere there is the conviction, amply born out by evidence, that there is no place in Dodge Bros. organization for that dealer who doubts that an honest reputation is the highest asset in business. This has already brought to Dodge Bros. and their dealers, a public good will of almost priceless value, which good will asset, however, does not appear on our balance sheet. Dodge Bros. have in mind and are working to the end that the fact that a dealer possesses their franchise makes him as good a

risk to his banker as a government bond. Dodge Bros. also have ever recognized that to be permanently successful themselves, their dealer organization must also be successful. (It has been said that the only must in the relation between them is that the dealer must make a profit, not only in one year, but over a period of years.)

"This had led to a close scrutiny of the dealers' methods and practices by the home organization, and a constant effort on the part of Dodge Bros. to build up and improve the dealer's business and merchandising standards."

The pamphlet relates the work of district representatives and salesmen in this connection and says their work is supplemented by experts from the systems division of the home office, who work continually among the dealers, installing proper systems, analyzing reports and conditions and working always for better business methods. Quarterly financial statements are required from all dealers, and these with reports from field men give the factory an extremely comprehensive knowledge of dealer conditions. Because of this knowledge valuable constructive work has been done among dealers.

One Basic "Design"

The Dodge Bros.' policy of one basic design is described. This policy of constant refinement without frequent radical changes of design is said to have tremendously enhanced the earning power of the dealer. His new and used car stocks have not been periodically depreciated in value by the sudden appearance of new models, radically different in appearance, which artificially depreciated the value of types previously marketed.

"Never has, or will, the influence of passing fads, be permitted to affect the stability of the dealers' business," the booklet says.

Of the financial strength of the company, it is stated that it has never borrowed a dollar and earnings from the business have been put back into it, to help establish even greater stability to facilitate constant betterment of the product, and to form necessary reserve in time of need. This financial strength of the company, it is declared, constitutes a perpetual guarantee of permanence to the dealer. It enables him to invest and expand in exact proportion to his ability to earn.

As an indication of Dodge Bros. characteristic policy toward dealers, the action of the company in refunding full amount of reduction on the two occasions when lower prices became effective, is related. This must not be taken as establishing a precedent, the statement declares, but indicates the company's desire to be fair and just, all factors being considered. To keep accurate check on conditions, Dodge Bros. requires from every one of its dealers a weekly report

on deliveries to customers, an inventory of all cars, new and used together with comments relative to trade conditions in their vicinity. Also any suggestions they may have, knowing the exact conditions. In each territory officials are in position to determine whether more cars shall be shipped or whether the dealer has sufficient for the time being. Calculations at the factory are determined upon the number of cars actually consumed by the public and not upon factory shipments. The standing of each competitor in each county is known, the statement declares, and reasons for their positions are constantly being studied and analyzed.

Dodge Bros. dealers' inventories are declared as liquid and safe as merchandise can be. The company's policy demands that succeeding dealers take over stocks at inventory value. Used car inventory is kept at a minimum and represents good value. Factory supervision and education of dealers keeps the acquisition of these by dealers on a sound marketable basis. New car sale losses are preferred to exorbitant allowances on used cars. Dealers are advised to allow no more for a used car than they would pay for it in cash in the open market. Service departments of dealers are profitable, says the statement, because the factory would never allow dealers to diminish their profits by giving free service. Owners pay for service as it is needed.

Referring to the future market, the statement says Dodge Bros. problem has never been one of demand, but rather of production. Nevertheless, the statement declares, even in the face of this there has never been, nor will there ever be, a tendency so to expand this business that it will be other than sound, nor has there been, or will be, any departure from the traditional principals of quality as laid down by the founders.

CINCINNATI DEALERS ELECT

CINCINNATI, O., May 22—The Cincinnati Automobile Dealers' Association at its annual meeting, held at the Hyde Park Country Club, elected directors for the ensuing year, and the elected directors immediately withdrew and elected officers as follows: President, Frank J. Santry, president of the Nash Cincinnati Motors Co.; vice-president, Charles E. Bishop, president of the Bishop Motor Car Co.; secretary, E. A. Kruse of the Fulton Kruse Co.; treasurer, W. G. Welbon, president of the Welbon Motor Car Co.; directors, Richard Herold, president of the Herold Motor Car Co.; Charles Schlear, president of the Charles Schlear Motor Car Co.; W. J. Tarbill, president of the Citizens' Motor Car Co. and A. T. Herschede, president of the Herschede Motor Car Co.

Annual reports and other routine matters were disposed of. A donation of \$100 was made toward financing the Free Tourists' Camp, established by the Cincinnati Automobile Club.

CONCERNING MEN YOU KNOW

J. B. Dawson has been named by the Connecticut Valley Motor Sales, Inc., as Paige and Jewett dealer in Palmer and Ware, Mass. Associated with him is S. L. Meagher, formerly manager of the Hampden Motor Co., of Springfield.

C. C. Moore has signed up as Hupmobile dealer in Westfield, Mass.

James M. Morton has resigned as sales manager for the Springfield (Mass.) Durant Co.

H. L. Hammond, formerly of the Indianapolis Reo sales organization, has been appointed territory man for the Herold Motor Car Co., Cincinnati, distributor of the Reo.

Geo. M. Graham, vice-president and general manager of the Chandler Motor Car Co. of Cleveland, addressed nearly 100 of the dealers, sales and service men of the Hodge Long Motor Co., Cincinnati distributor of the Chandler, at the Hotel Gibson recently.

John D. Mowe, vice-president and sales manager of the Kelly-Springfield Tire Co., who has been on sick leave for more than six months, has returned from Florida, much improved. He has resumed his work at New York headquarters.

William H. Kilpatrick, former manager of manufacturing of Willys-Overland, Inc., has been promoted to the position of assistant to President John N. Willys. In his new capacity Kilpatrick will assist President Willys in manufacturing plans at the Toledo factory and also at the associated plants. J. A. Sheldon, production manager, has been advanced to the position of works manager.

E. B. Jackson, president of the Wills Sainte Claire Co. of New York, has retired from the retail selling field, having accepted the position of director of sales of the Durant Motor Car Co., of Muncie, Ind., making the Princeton car. Jackson is a veteran of the industry, starting with John Wanamaker when that big corporation handled metropolitan sales of the Ford 20 years ago. Later Jackson was manager of the Packard branches in New York and Philadelphia and was a vice-president of the Willys-Overland Co. two years ago, being in charge of sales. The New York representation of the Wills Sainte Claire will be taken over by W. J. Foss of Philadelphia, who has the Wills franchise in that city.

Having recently resigned as vice-president and director of sales of the Trexler Co., Walter P. Coghlan has actively entered the Moon Motor Car Co., of New York, of which he has been an officer for a number of years. While acting in the capacity of treasurer of the company, he

will devote most of his time to wholesale sales and sales promotion work.

Branch Manager J. L. Snyder of the White Company, who has been in Salt Lake City, Utah, for some years, has been transferred to the San Francisco district as manager. He will be succeeded by R. A. Parker, formerly of San Francisco.

R. C. Frampton, president of the Hudson-Frampton Automobile Co., of St. Louis, has just returned from a four weeks' trip to the Pacific Coast.

A. M. Robbins has resigned as manager of the Indianapolis branch of Nordyke & Marmon Co. and assumed the duties of manager of the Boston branch of the Apperson Bros. Automobile Co., of Kokomo, Ind.

Geo. F. Day, formerly with Nachtrieb & Co. of Dallas, Tex., and Kansas City, has joined the sales organization of Apperson Bros. Automobile Co., of Kokomo, Ind., as district manager for Texas, Oklahoma, Louisiana and Arkansas with headquarters in Dallas.

R. D. Brown has been named manager of the Atlanta branch of the Martin-Perry Corporation, to succeed R. G. Seibert, who was promoted to the company's general offices in New York.

W. C. Harris has been named manager of the Atlanta branch of the Firestone Tire & Rubber Co., 21 Walker street, succeeding Wylie West, manager of the branch for several years, recently resigned to enter the equipment business for himself.

V. H. Day, general sales manager of the General Motors Truck Co., of Pontiac, Mich., is making a survey of the Pacific Coast and northwestern territory truck sales market. He expects to be gone about four weeks.

F. M. Young, who has been connected with the Perfex Radiator Co., of Racine, Wis., since 1919, has been made vice-president and general manager of the Racine Radiator Co., successor to the Perfex company. Young and a number of associates recently purchased the Perfex company.

J. P. Schiller has become Southern California representative of the India Tire & Rubber Co., with headquarters at Los Angeles. He formerly was head of the J. P. Schiller Co., distributor of automotive specialties.

W. I. Ward, district manager of the Commerce Motor Truck Co. and formerly with Kelly-Springfield, has been named as district sales representative of the United Motor Products Co., of Grand Rapids, Mich.

Galesburg Automobile Days Set for May 23, 24 and 25

Prizes to Be Awarded to Owners;
All Merchants to Aid in
Affair

GALESBURG, Ill., May 19—Members of the Galesburg Automobile Dealers' Association and all merchants of the city, are combining to capitalize the motor vehicle as a business getter and have arranged for Galesburg Automobile Days, May 23, 24 and 25. Prizes aggregating \$2,000 in value were donated by the various business houses and 100 prizes are to be distributed each day. Three parades are to be held.

The first day will be marked by a display of new cars and trucks. The second day is to be devoted to a parade of used cars. The third day is set aside for floral decorated cars. The prizes are to go to car owners coming the longest distance; car owners with the oldest car; those with the largest family; the fastest driver, etc. The capital prize of \$200 goes to the car most attractively decorated in the parade on the concluding day. A band concert each day will enliven the occasion.

It is believed that two or three of these events each year will prove a trade stimulant and help not only the motor car dealer, but all lines of business.

WILLIAM SMALL CREDITORS PAID

INDIANAPOLIS, May 24—Final payment of 2.32 cents on the dollar will be made creditors of the defunct William Small Company former manufacturer of the Monroe automobile here as announced by Judge Sidney S. Miller following a final report of Receiver J. W. Fesler. This will make a total of about fourteen cents on the dollar that the creditors obtain on their claims.

When the company went into receivership in 1920 there was more than \$1,000,000 in claims filed against the concern. The Monroe car and plant was later sold by the receiver to a new company that operated it under the name of The Monroe Automobile Company which was recently taken over by Strattan Motors Corporation which is to continue manufacture of the Monroe as the Monroe division of the Strattan Motor Corporation.

F. J. WAGNER IN BUSINESS

LOS ANGELES, May 23—It will be of interest throughout the country to learn that Fred J. Wagner, the famous starter of motor races, has decided to make his future home in Los Angeles and in order to keep busy when away from speed events he has embarked in the automobile painting and refinishing business. Associated with Wagner is A. C. Webb, one of the country's first automotive engineers, a former race driver and inventor. The organization will be known as the Wagner-Webb Co., Inc.

Two Governors Veto Bills to Levy Tax on Gasoline

DETROIT, May 23—There will be no change in automobile taxation in Michigan for the coming two years, unless the Governor calls a special session of the legislature, as this body has adjourned after defeating the weight basis bill advocated by the chief executive. Some time earlier the Governor vetoed the gasoline tax of two cents a gallon.

Without an increase in funds received from automobile taxation the State is practically declaring a highway construction holiday. Practically all funds now being received as the State's share are required for payments on highway bonds now outstanding leaving only about \$1,000,000 a year for maintenance. Same Action in Iowa

DES MOINES, Ia., May 12—Unless a special session of the Iowa legislature called to meet in December to revise the Iowa code overrules the Governor of the state by a two-thirds majority there will be no gasoline tax for the improvement of highways.

Such a bill was passed at the recent legislative session but in the final days of the session Governor Kendall vetoed it.

In his veto Governor Kendall declared

that the tax "is plain and palpable sales tax, assessed on liquids employed for the development of heat and power regardless of whether or not such liquids are used for the operation of motor vehicles."

FYRAC MOVES OFFICES

ROCKFORD, Ill., April 22—The Fyrac Manufacturing Co. has moved its offices to Seventh street and Eighteenth avenue, adjacent to its manufacturing plant, and A. F. Hogland, president, announces that the change will make it possible to undertake a program of expansion which has been necessary to meet the demands of its growing business. The Fyrac concern is producing three lines of spark plugs, Ford heaters and gas savers. It is about to introduce a new timer and the new factory space available will make it possible to rush this work along.

HESS SPRING AUCTION

CLEVELAND, May 21—Receiver Frank A. Scott, of the Standards Parts Co., will sell at auction the Hess Spring and Axle Plant, at Cincinnati. Samuel N. Winternitz & Co., of Chicago, is the auctioneer who will dispose of the plant for the receiver. The company was allowed \$2,500 by Federal Judge Westenhaver to advertise the sale.

BUSINESS NOTES

The following dealers have been appointed to handle the Chandler car: The Garside-Charrett Motor Co., West Union avenue, Bound Brook, N. J.; Superior Garage Co., Maple and Fayette streets, Perth Amboy, N. J.; Shipman Motor Sales Co., 26 N. 5th street, Sunbury, Pa.; Crawford Motor Car Co., 360 McSeehannock avenue, New Castle, Pa.; Oregon-California Highway Garage, Klamath Falls, Ore.; Chester A. Miller, Inc., Hudson, N. Y.; J. W. Kearney, Cresson, Pa.; Foxboro Auto Co., Cocasset street, Foxboro, Mass.; Boyer Bros., Dwight, Ill.; Ralph Myers Motor Co., 62 High street, Akron, O.; H. M. Williams, 1214 Walnut street, Boulder, Colo.; Harry Hill & O. S. Matson, Standard City, Calif., and William Nobbe, Waterloo, Ill.

J. Francis Derse, Inc., is the name of a new Milwaukee corporation with \$5000 capital organized by J. F. Derse and associates to deal in motor vehicles and supplies, principally commercial cars.

Dr. C. F. Lawler, Hilbert, Wis., will build a \$20,000 garage, display and service building.

The Capital Garage Co., Madison, Wis., is breaking ground for a new headquarters building, 65x165 ft., two stories and basement, costing \$55,000.

The Cole Motor Car Co. of Indianapolis announces the appointment of the following as distributors in their respective territories: Cole Eads Motor Co., St. Louis, Mo.; American Motor Car Co., Newburgh, N. Y.; Cole Westervelt-Wassor Auto Co., Des Moines, Ia., and the Canadian Auto & Garage Co., Windsor, Ont., Canada.

The Trexler Co., Wilmington, Del., manufacturers of automobile accessories, is planning to enlarge its plant greatly in the near future.

The Covey-Ballard Motor Co., Ford dealers at Salt Lake City, Utah, has decided to go into the wholesale accessory, tire and commercial body business. In addition to city salesmen they will have men covering the trade of the mountain states.

The Johns-Manville Co., Cleveland, O., is tripling its factory space and quadrupling its general offices in order to take care of business.

The Connecticut Telephone & Electric Co., Meriden, Conn., has purchased the plant of the Wilcox & White Co., maker of player-piano which recently went into the hands of a receiver, and is located near the No. 1 plant of the Connecticut company. It is a four-story modern brick structure, with approximately 125,000 sq. ft. of floor space which will be used for the general expansion of the purchaser's business.

Detroit Motor Body Co. has been formed by a group of business men of Detroit and other cities, headed by William B. Hurlburt, formerly president of the Hurlburt Motor Truck Co., to build bodies for passenger car companies on a production basis. The company will take over the plant of the Andrew C. Sisman Co. at Detroit as a basis of operation and plans acquisition of other properties. Operations are to start in four months. The new company has capitalization of \$10,000 preferred stock and 810,000 shares of no-par common.

The Sparta, Ill., Auto Parts Co. has been organized with capital stock of \$10,000 and will manufacture and deal in parts for motor vehicles. The promoters include J. E. Chase and Francis McDill.

Sale of the property and plant of the bankrupt Oliver Rim Co., manufacturers of automobile rims in Atlanta, has been ordered by the Federal Court, after a hearing on a petition by the stockholders of the company.

Harry N. Fowler, a veteran of the automotive industry in Chicago, has organized the Fowler

Auto Rebound Control Co., which will maintain offices at 2111 South Michigan avenue. The company will act as western distributor for Blake Bump Breakers.

Reo Motor Car Co. has declared an extra cash dividend of 6 per cent and a stock dividend of 10 per cent. In addition the regular quarterly payment of 1½ per cent has also been declared, all dividends being payable July 2 to stockholders of record May 31.

American Chain Co. and its subsidiaries report that for the first three months of 1923 profits of \$882,890 have become available for dividends. This does not include the profits of the English subsidiary. Gross sales for the quarter were \$7,225,468 against \$2,981,856 in the same period last year and \$17,565,110 in the full year 1922. Earnings for the first quarter of 1923 were equal to four and one-half times the fixed dividend requirements of the company's 8 per cent cumulative participating Class A stock now outstanding.

Cadillac shipments during April were more than 25 per cent greater than the best previous month the company has experienced, while deliveries to owners eclipsed all previous monthly records.

Stutz Motor Car Co. of America announces that retail sales of Stutz cars so far this year have almost equaled the total sales for the entire year of 1922. April was one of the company's best months and May and June promise equally as well.

Hudson Motor Car Co. states that sales and shipments in April totaled 9200 cars, while the May schedules call for the manufacture of 9500. Inventories, it is said, are considerably lower than in previous years.

Buick sales for the first quarter are reported as approximately 29,717 cars, or 156 per cent over the same quarter of 1922. Monthly sales averaged in excess of 16,000 cars. A turnover of inventory 3.53 times is reported for the quarter.

The Stoughton (Wis.) Wagon Co., which in the last two years has developed a large business in making cabs and truck bodies for Ford cars, has leased a large building near the Chevrolet plant at Janesville, Wis., and is starting production on commercial car bodies designed for application to Chevrolet business chassis. The Chevrolet plant, besides reaching a schedule of 275 cars a day at the close of last week, is putting out 300 commercial car chassis in May and has a schedule of 200 for June production.

A \$500,000 addition, doubling the capacity of the Seamon Body Corp., Milwaukee, is being completed and will be ready to start production June 1. The building is 5 stories high, 225x450 ft., and is identical with the original factory erected three years ago at Richards and Lake streets. The Seamon company is engaged principally in building enclosed bodies. Charles W. Nash, head of the Nash and LaFayette companies, owns a half interest in the concern.

The Wenstone Rubber Products Co., Chicago, which in January acquired the plant of the Boone Tire & Rubber Co., at Chippewa Falls, Wis., expects to place the factory in operation on a normal production schedule with 200 men on June 1.

According to a statement issued by W. A. M. Vaughan, treasurer of the Seiberling Rubber Co., that concern, without additional financing, is in position to produce an \$8,000,000 volume of business in 1923. With 2600 dealers handling Seiberling products, sales of \$479,000 in January, \$602,000 in February and \$613,000 in March are reported, with profits of \$14,000, \$56,000 and \$88,000 in the respective months. Vaughan states that in 1922 sales totaled \$3,845,000, with \$56,000 profits.

a rate that indicates that the sales will, during May, exceed the volume for April by at least 40 per cent. This company's production at present is about 50 per cent enclosed cars.

A canvass of dealers disclosed they are also selling a larger number of closed cars than they did a year ago. This applies to Buick, Dodge, Chevrolet, Chalmers, Maxwell, Hudson and Olds. Some dealers say their sales are 50 per cent closed cars; others are disposing of 40 to 45 per cent closed cars, while some place the ratio as low as 35 per cent.

Shipments Held Up by Poor Transportation; Orders Heavy

Illinois Dealers Reach High Point in Sales But Deliveries Are Slow

DECATUR, Ill., May 19—Sales of automobiles in Decatur and vicinity promise to reach new record levels this year, according to the local dealers. All classes of cars are selling freely, but there is considerable difficulty experienced in procuring a supply equal to the orders. This is particularly true of the low and medium priced cars, while even some of the higher priced ones are difficult to procure when wanted. Transportation conditions are bad and most of the dealers are forced to drive their cars from the factories.

"Our sales so far this year are ahead by 50 cars of the total for 1922," declared one of the leading dealers of Decatur.

The easy payment plan, at first frowned upon by many of the dealers, is now in general vogue and is responsible for many of the sales put over. It has been found, much to the surprise of the trade, that not only those who are unable to pay cash, but many of those who are in a position to pay the entire amount for a car, are adopting the payment plan. The reports to the Macon county recorder's office, give some idea of the large number of persons who are buying cars upon payments, giving a chattel mortgage to secure the dealer. In a single day here recently, more than 50 of such instruments were recorded.

Some dealers have originated their own corporation to finance the sales of these cars, taking over the chattel mortgage and collections, while others are taking advantage of financing corporations organized by the car manufacturers. It has been the experience of this community that the payments upon the majority of the cars are made promptly and that very few are being turned back because of inability to meet the dues. Another proposition, just submitted here, calls for the weekly payments that increase proportionately and when a certain sum is deposited, the car is delivered. This scheme is similar to that of the Christmas savings club. It is expected to prove popular and will, doubtless, add to the number of sales. Prosperity is general here, not only in the industrial and manufacturing line, but also among the farmers.

LOS ANGELES DEFEATS BUSES

LOS ANGELES, May 22—Verified returns from Tuesday's election show defeat for proposed operation of motor busses in city by large margin. Eastern capitalists said to have been identified with Fifth Avenue Coach Line of New York City, St. Louis lines and elsewhere, sought by initiative measure permission to operate 125 double deck busses. The petition was opposed by electric rail line.

More Enclosed Cars Being Sold by Cleveland Dealers

CLEVELAND, May 21—The Cleveland Automobile Co. established a new peak production record during the month of April.

In March, this year, 40 per cent more Cleveland cars were shipped from the factory than were transported in the corresponding month a year ago. Records of the sales department show that April shipments this year were 50 per cent greater than they were in March.

Distributors are sending in orders at

IN THE RETAIL FIELD

Bauer Auto Sales Company, Cincinnati, Ford agency, will construct a four-story brick addition, immediately west of the structure which they now occupy, at a cost of approximately \$100,000 according to an application they have filed with the local building commission.

Commerce Motor Co., of Shreveport, La., and the Sioux Falls Motor Co., Inc., have been named distributors of the Olds Motor Works of Lansing, Mich., in their respective territories.

Shoberg Motor Co., of Sioux City, Ia., is again Oldsmobile distributor, having last week signed a contract for a territory covering 32 counties about Sioux City, including counties in Iowa, South Dakota and Nebraska.

Charlotte Motor Co., distributor of the Hupmobile at Charlotte, N. C., has bought a lot at South Boulevard and Oak streets and will erect a new home.

Seventy-five dealers in Willys-Knight and Overland cars in North and South Carolina left Charlotte recently for an inspection trip to the Willys-Overland factory at Toledo, O. The dealers took the trip as guests of Dail Overland Co. of Charlotte, distributor for the two states.

Among the distributors who have been awarded the Kissel franchise for the new Model Fifty-Five as well as the DeLuxe Forty-Five are the St. Louis Motor Car Co. for the Missouri territory; Kissinger Motors Co. for the Columbus, O., territory; Kanouse Auto Co. for the Indianapolis territory; Franklin Motor Car Co. for the Toledo, O., territory, and Oscar M. Nelson Automobile Co. for the Minnesota territory, with the Walker Automobile Co. for the St. Paul district.

Don Jenkins, of Kokomo, Ind., who has been connected with the automobile industry in various phases for a number of years, has been appointed Haynes distributor for Kokomo and five adjoining counties, according to an announcement by Gilbert U. Radoye, director of sales and advertising for The Haynes Automobile Co. of Kokomo.

The Toledo-Haynes Motor Co., of Toledo, O., has been appointed distributor for Haynes cars in Toledo and the surrounding territory. The company occupies handsome salesrooms at 1502 Madison avenue.

Eisenberg Bros. Motor Sales Co., 1819-21 S. State street, Chicago, has been incorporated to deal in and repair automobiles and accessories, etc.

The following concerns have been appointed as dealers and distributors of the Auburn car: Noonan & Findleyson, Ottawa, Ont., Canada; Weaver Motor Co., Laclede, Mo.; American Motors Co., 1000 E. Main street, Louisville, Ky.; Murphy Motor Car Co., 514 Alder street, Portland, Ore.; Emin Motor Car Co., New Bedford, Mass.; Aschenbrenner & Olmstead, 90 Ottawa avenue, Dixon, Ill.; Patterson Battery Co., 10217 Superior avenue, Cleveland, O.; A. E. Hays, Terre Haute, Ind., and the Marshalltown Auburn Co., Marshalltown, Ia.

Wiswell's Garage, Elkhorn, Wis., has been taken over by the Zwiebel & Griebel Garage Co., a new organization consisting of Henry Griebel and Harold and Herbert Zwiebel, which will operate as the Badger Garage and deal in the Nash, Star and Durant.

The Hassler-Wisconsin Co., Milwaukee, has been incorporated with \$10,000 capital to distribute Hassler shock absorbers in Wisconsin. Frank L. McNamara, 800 Trust Co. Building, Milwaukee, represents the principals.

The Heuer & Hettinger Motor Co., Sheboygan, Wis., has been appointed Jordan and Auburn dealer and opened a new garage and service station at 1519 North Twelfth street. The owners are Fred Heuer and Eugene Hettinger.

The Northwest Buick Co., Milwaukee, is a new corporation with a capital of 2000 shares of non-par common stock, organized by R. J. and A. L. Cleary and A. F. Grueschow to retail the Buick. It is the sixth Buick retail dealership established in the city and county of Milwaukee, with concurrent jurisdiction.

Paul Gelf and F. W. Schultz, LaCrosse, Wis., have combined as Gelf & Schultz to act as Moon dealers, with headquarters at 325 Jay street, LaCrosse.

W. B. Eikenberry, of Fort Dodge, Ia., has been awarded the contract for selling and distributing the Gray car in twenty counties of northern Iowa.

The Antigo Garage, Superior street, Antigo, Wis., has been taken over by Walter Dorzeski and George Kielcheski, who have been granted Paige and Jewett and Oldsmobile franchises.

New automobile agencies formed in the Southeast in early May include the following: The Pendleton Motor Co., of Pendleton, S. C., with \$50,000 capital, headed by F. G. Herron; Everett Brothers Motor Co., of Athens, Ga., with \$85,000 capital, headed by Harry W. Everett; Pal-Gilbert Motor Co., of Charleston, S. C., with \$25,000 capital, headed by J. R. Paul; Ozark Motor Tractor Co., of Ozark, Ala., with \$12,000 capital, headed by Fred T. Dowling.

The Wills Ste. Claire Co. of Illinois, of which Dayton Keith is president, has moved from 2336 South Michigan avenue to 1631 South Michigan avenue, Chicago. The Roy Iverson Co., Dorris distributor, moved into the quarters vacated by the Wills Ste. Claire company.

Weldon-Gillick Motor Co. has succeeded the Weldon Sales Co. as distributor for Durant and Star cars at Watertown, N. Y. Mr. Gillick, the new member of the firm, was formerly a Ford dealer at Clayton, N. Y.

Ramsey Motors of Kansas City, Mo., has taken over the Oldsmobile distribution in that territory. The company is located in the building formerly occupied by the Midwest Oldsmobile Co. at 2201 McGee Trafficway. At the head of the company is S. W. (Sam) Ramsey, former president of the Midwest Oldsmobile Co.

The Heck Motor Sales, handling Star and Durant cars, has been opened at 709 Chicago street, Manitowoc, Wis., by Otto Heck who for the last seven years has operated the Heck Garage at Antigo, Wis.

Withers & Chapman is the name of a new automotive equipment company and service station established in Atlanta recently, with headquarters at Spring and Walton streets. G. W. Withers and R. A. Chapman are the organizers, the latter for many years with F. E. Maffett, Inc., Dodge Brothers distributor in Atlanta.

Headed by N. N. Teague, the automobile dealers of Augusta, Ga., have organized and incorporated the Augusta Automobile Dealers' Statistical Bureau, with a capital stock of \$5,000. Exchange of credit information and compilation of statistical information important to automotive dealers will comprise the work of the association.

The Hardy Motor Co., of Bells, Tenn., according to a recent announcement of J. B. Hardy, president, is planning the construction this year of a new building to be used as a service station and automotive agency.

With a capital stock of \$100,000, the Overland Lakeland Co., of Lakeland, Fla., has been organized and incorporated, and will act as Overland distributors in that section of Florida. G. D. Stoner, of Lakeland, is president and treasurer of the company. Headquarters have been established at 320 West Main street, Lakeland.

The Oldsmobile-Albany Co. has been organized and incorporated at Albany, Ga., with \$10,000 capital, to act as Oldsmobile distributors in that section of Georgia. David S. Crandall, of Fort Valley, Ga., and William F. Spurlin, of Albany, own the company.

The A. C. Price Motor Car Co., Rockford, Ill., distributor of the Cadillac and Chevrolet cars, has taken a five-year lease on a new garage building, corner of Church and Green streets, which will cost \$60,000. Ground will be broken June 1.

Earl L. Smith and Merle G. Smith, Peoria, Ill., have taken over the Packard car distribution for the counties of Peoria, Tazewell, Woodford, Marshall and Stark, and will have their headquarters at 828 Main street. They succeed Fred Jones, who retires after serving as Packard representative for five years.

C. W. Dickinson has taken the agency for the Buick in Shelburne Falls, Mass.

Thomas Boothman has bought from Steele & Calusha their large garage near the Idlewild Hotel, in Williamstown, Mass.

Elmer F. Byrne has taken on the sale of the Chandler for Norwood, Ohio, a municipality completely surrounded by the city of Cincinnati, under the name of the Norwood Chandler Sales and Service Co., 4912 Main avenue, Norwood.

The A. G. Ewert Motor Sales Co., 2448 Lisbon avenue, Milwaukee, has been appointed wholesale and retail distributor of the Columbia Six.

The following dealers have been appointed to handle the Chandler car: H. S. Hill Co., Gettysburg, Pa.; G. P. Rusk, Shenandoah, Pa.; Geo. L. Ewing & Bros., 108 E. 8th street, Homestead, Pa.; P. H. Stettler, 114 Jones street, Woodlawn, Pa.; C. L. Branche, 14 Main street, Batavia, N. Y.; Hapgood & DeLambert, Kingsley, Ia.; T. H. Bainbridge, Marion, Ill.; Brown & Keith Motor Co., Rumford, Me.; Avery Auto Sales, 17 Chester street, Newton-Highland, Mass.; Grant Bros., Inc., 27 Railroad avenue, Pawtucket, R. I., and the Jones-Mayes Motor Co., 421 11th street, Huntington, W. Va.

Norman Willet has the agency for the Buick in Ware, Mass.

Among new distributors for the Auburn car are the following: Miner Motor Co., 13 North-ern Blvd., Albany, N. Y., and the Missouri Motor Sales Co., 2110 Grand avenue, Kansas City, Mo.

The following dealers have been appointed to handle the Auburn car: Smith's Garage, 134 Oakland avenue, Greensburg, Pa.; Peter J. Huettman, West Side Garage, Port Washington, Wis.; Georgetown Motor Co., Georgetown, Ill.; W. A. Marlowe, Enderlin, N. D.; Slawson, Son, Olean, N. Y., and the Fitz Motor Co., 55 A street, N. E., Linton, Ind.

Among new dealers for the Chandler are the following: The Holland Garage, Springfield, O.; J. S. Douth, 25 Main street, Salem, O.; Kelley Motor Sales Co., Battle Creek, Mich.; Orval L. Dawes, 568 W. 4th street, Peru, Ind.; South Missouri Power Co., Greenfield, Mo.; F. E. McLeary, Church and Main street, Farmington, Mo.; Zingsheims Garage, 1212 Washington street, Manitowoc, Wis.; Montgomery Street Garage, 18-20 Montgomery street, Middletown, N. Y.; Donald S. Haring, 168 Pike street, Port Jervis, N. Y.; F. H. Van Dorn Co., 75 Broad street, Red Bank, N. J.; The Tooker Sales Co., 4 Main street, Stamford, Conn.; Woolfolk Motors Co., Inc., Ann Arbor, Mich., and the H. D. Graham, 700 East street, Warren, Pa.

The Erwin Sales Co., 763 State street, Salt Lake City, Utah, has been appointed a Chevrolet dealer.

The Knight Motor Co., Ft. Dodge, Ia., has signed a contract for the distribution of Velie cars in the territory about Fort Dodge.

Amoundson Bros., formerly of Clarion, Ia., are moving to Fort Dodge to open up a sales agency for Chandler and Cleveland cars.

Barish Bros., Sioux City, Ia., who operates a service station and second-hand car market, have opened Chevrolet agencies at Norfolk, Neb., and Cedar Rapids, Ia.

H. C. Merry, manager of the Wilson Motor Car Co., Haynes and Dort distributor in St. Louis, has arranged for A. G. Sieberling, general manager of the Haynes Automobile Co., and Gilbert U. Radoye, director of sales of the same company, to be in St. Louis at the opening of the enlarged quarters of the Wilson Co. at 2921-29 Locust street.

Geo. Troxler and Nick Hibbler, partners, have been appointed to handle the Hupmobile district in St. Louis known as the Thirty-Ninth Street District. Their showroom is on the southwest corner of 39th street and Blaine avenue, where they have conducted a garage and service station for some time.

B. Jay Barrier, long known in the industry, has formed a partnership with A. E. Post and has taken over the old Main Garage at 4941-45 West Chicago avenue, Chicago, where they expect to conduct a strictly modern garage and repair shop.

William Frede & Son, Decatur, Ill., have moved into a new garage and service station at 105 North Franklin street. The firm distributes the Chevrolet car in the Macon county territory.

W. J. Fuller, president of the Fuller Automobile Co., Cincinnati distributor of the Hupmobile for a large territory, has established a branch across the Ohio River, opposite Cincinnati, at 24 East 5th street, Covington, Ky.

Albert Youngren, 123 West Church street, Kewanee, Ill., has opened an automobile repair shop and garage and is handling a full equipment line. He was formerly associated with the Tracey Motor Corp.

R. L. Sullivan, Palmyra, Mo., has erected a modern garage building, 50x60 ft., and plans with his sons-in-law, Guy White and Milton Keller, to open an up-to-date service station there.

Twenty-five Goodyear tire dealers from the eastern Iowa territory met in Waterloo, Ia., May 8, for their annual "shop talk." J. J. Dysart, district agent, was in charge of the meeting.

In observance of the formal opening of their new building at 1229 North Broad street, Philadelphia, as the home for Jordan cars in that territory, Petersen Motors, Inc., distributors, held a public reception. In the evening a dinner was given to the entire organization, in the Hotel Majestic, addresses being made by Edward S. Jordan and William B. Riley, general sales manager of the factory. Fred J. Petersen, president of the Philadelphia company, presided and there were about 200 at the tables.

The LaCrosse (Wis.) Auto Supply Co., a new \$50,000 Wisconsin corporation, is engaging in the wholesale distribution of automotive equipment and supplies with offices and warehouse at 522 State street, in the Fisk building. Matt D. Cameron, a local dealer, is president. F. L. McAndrews, formerly of the Northwestern Auto Supply Co., Minneapolis, is treasurer and general manager.

The C-W Tire Stores system is opening a branch in Madison, Wis., under the management of William Haak.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

To Increase Speed of Model 6-66 Paige

Q—Give us suggestions for changes in a 1921 model, 6-66 Paige, 7 passenger touring car equipped with a Continental engine, which will enable us to get a speed of 75 m.p.h. The car at present will do 65 m.p.h.—Geo. Huddleston, Ottawa, Ont.

Balanced parts are quite essential for attaining high speeds. This includes having the crankshaft together with flywheel both in static and running balance. Static balance may be attained by checking on parallel knife edges to see that in any position of the crankshaft there is no tendency for it to rotate. Running balance can only be checked by means of a balancing machine which usually requires sending the crankshaft and flywheel to a crankshaft factory.

For your purpose we would first suggest checking the connecting rods to see that the lower ends weigh the same and also that the upper ends weigh the same. A method of testing connecting rods was shown on page 47 of the May 3rd issue of MOTOR AGE.

Another change which will permit of higher speed will be the use of aluminum pistons of the constant clearance type, and in making installation of such pistons you should carefully follow instructions given by the maker, as to proper clearance and relieving in the vicinity of the piston pin boss.

You can increase the compression by planing off perhaps 1/16 in. from the cylinder head but in doing so you are taking a chance on having a power knock, usually known as detonation. This may necessitate the use of fuel composed of half gasoline and half Benzol in order to prevent knocking with higher compression. As much as 1/8 in. may be planed off if it does not cause interference with the valves, but it would be best to start with 1/16 in. first and try the effect of this change then taking off 1/32 more if it seems desirable.

Another change which will give greater power is the installation of larger valves. As nearly as we can determine the present valve has a head diameter of 2 in., stem diameter of 3/8 in. and overall length of 6 3/8 in. We would advise however that you check up on these dimensions. It will then be possible to install valves having a head diameter from 1/8 to 1/4 in. larger. It is possible that in your vicinity you can shop around and locate such a valve. However, source of supply will be given by letter.

You will also cause some improvement in the power and speed if you take

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

a small grinding wheel on the end of a flexible shaft and grind the roughnesses out of the valve ports in the cylinder block. This permits easier flow of the gases into the cylinders.

We believe the above changes will easily enable you to attain the additional speed desired, but if you wish to further increase the power of the engine would suggest getting a special camshaft, source of supply being given by separate letter.

Records of a business are essential to permanent success. Many practical maintenance men fail to keep records because they are not familiar with complicated bookkeeping. Read about the complete but simple system described on page 19 of this issue.

The Meaning of Torque

Q—Explain what the torque of an engine is, and how this torque is measured. Also advise what use is made of the torque in lb. ft. in calculating the h.p. of an engine and explain what a high torque engine is.—Charlie Kreshel, Wilber, Neb.

Torque is a name for the twisting or turning efforts that an engine is capable of exerting. It might be compared to the efforts a man can exert in cranking a car. For example if on a crank 1 foot long you can exert a force of 50 lbs., it means you have a torque of 50 lb. ft. If the same force were exerted on a 2 foot crank, you would have a torque of 100 lb. ft., for we get the torque by multiplying the force by the radius through which it operates.

Now suppose that on a 1 foot crank you could exert a force of 50 lbs., which we will say is sufficient to break the engine loose. Now assume that you continue to crank the engine at a speed of 100 r.p.m., at which speed the 50 lb. effort is no longer required nor would you be able to exert this much force at the same time that you are spinning the engine at this speed. Let us assume that you exert an average effort of 10 lbs. so that multiplying by 1 foot radius you could say that the human engine, cranking the gasoline engine, is exerting a torque of 10 lb. ft. If it were then necessary to figure the h.p. it would be desirable to consider not only the torque but the speed at which the engine was being cranked.

Referring now to the gasoline engine the question of torque means the turning ability while the h.p. is a combination of turning ability and speed at which the rotation is possible. Accordingly we might have a slow speed engine with high torque capable of running 1000 r.p.m. We might have another engine with only one-half the torque, but capable of producing it at 2000 r.p.m., so that the actual h.p. of these two engines might be the same, the small one making up in speed what it lacked in torque.

As an illustration of this we have the modern high speed racing engine, somewhat limited in torque, by the limited piston displacement allowed, but making up for this by exceedingly high speed.

The torque of an engine is usually measured by means of an electric dynamometer which is just a convenient way of determining the pull of the engine at a certain radius and at the same time measuring the r.p.m. We assume that this information is sufficient and that you require a general idea of the subject rather than the exact mathematical figures.

Filling Station with Battery and Tire Service and Accessories

Q—We have a lot on the Chicago to St. Louis cement road with 60 ft. frontage and 200 ft. deep with a drop of about 8 ft. from front to rear. It now has a one story frame building on it about 60 x 50 ft. coming clear out to a 6 ft. sidewalk. The distance from the sidewalk to curb is 10 ft.

This frame building joins a brick building on the north and a private driveway on the south 7 ft. wide, the drive being the property of another party and cannot be utilized by us except possibly at the curb.

We wish to erect a drive-in-filling station with two or more pumps at the front, incorporating a tire service station, battery service station and accessory store with entrance for crankcase and other light service. We wish to use about 60 ft. or 80 ft. at present, so arranged that at any time we may build on the back for storage.

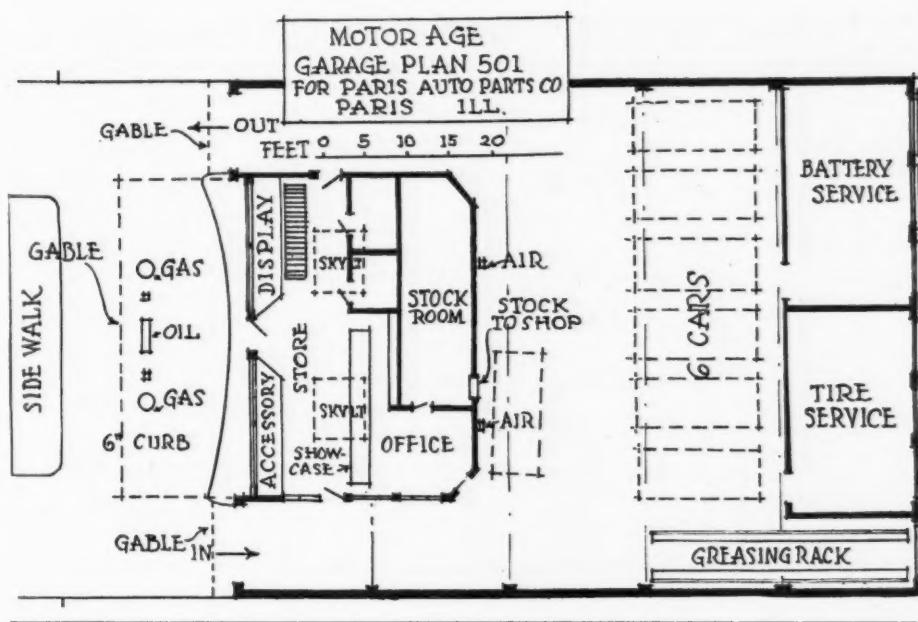
Our idea on mentioning the slope of the lot in the first paragraph was that we had considered utilizing the slope as a basement already dug and building the first building so that we could add a story or two later if we so desired.

We would appreciate your suggestions as to the most practical type of front for the above requirements and it is our intention to erect a front which will be very attractive and at the same time fill our needs for several years.—Paris Auto Parts Co., Paris, Ill.

We do not just understand what your scheme is in regard to the frame building that you now have and not knowing anything about this building, we have been obliged to go ahead and design something entirely new. Whether you intend to use some of your old building and merely build a new front on it or tear it down entirely and start over is, of course, up to you. Inasmuch as you will have to tear out the whole front for some 20 ft. back, it would seem advisable to start over again.

Our scheme comprises a building 60 x 80 ft. with a drive-in on one side and out on the other. There are two filling station runways of about 10 ft. width each and back of this the accessory store, office and stockroom. We think the rest of the plan will speak for itself and needs very little comment.

There is one part, however, that may be advisable in view of extending the building toward the rear, and that would be to place the greasing rack between the battery and tire service rooms in such a way that it should be removed later and the passage used for cars entering and leaving the garage which you intend to put in the rear. Perhaps, however, by the time you wish to extend your building, you will have some additional ideas that will make it necessary to move the service shop.



PUMICE STONE AS USED BY THE AUTOMOBILE PAINTER

Pumice stone is an abrasive used in a number of trades and is of particular value to the automobile painter for fine surfacing work on varnish. Its origin is quite interesting. When the lava of volcanic eruptions is rapidly cooled it case-hardens, and this results in a porous rock, as the confined gases force passageways for their liberation during the inward cooling of the mass. Large deposits of varying grades are found in volcanic regions, where it is mined in lumps or blocks, graded according to texture and turned into the channels of commerce. Ground, sifted and dried, it becomes the well-known pumice powder.

PROPER COMPRESSION FOR OVERLAND 90 PISTON

Q—What should be the compression of a Overland 90 piston to get the best results? We have one here that has compression of 105 pounds to the cylinder and we cannot get any power out of it, ignition is perfect and have checked it all over. The speed is up to standard.—Petterborg-Nash Motor Co., Inc., Preston, Idaho.

If the compression gage indicates 105 pounds compression you can rest assured that something is radically wrong with either the piston or the cylinder head. To determine whether the pistons have the proper compression space, that is the distance from the piston pin hole to the top of the piston we would advise that you remove one and check it against the following dimensions. The piston should be 4 in. in length over all. The compression distance as measured from the center of the piston pin hole to the top of the piston should be 2 in. If the pistons installed check with the dimen-

sions given, it would indicate that the cylinder head had been planed down and we would advise that you install additional gaskets until the compression pressure is brought down to at least 70 pounds. If the pistons do not check with specifications it is advisable to remove them and put in the proper size piston.

TO STOP LEAKY CARBURETER

Q—I would like to know how to stop a leaky carbureter on a 1920 model Franklin touring car. It seems this float is too high and leaks only when needle valve is open and car not running. I have adjusted float several times but it seems to do no good.—Ludwig Jahn, Prop., Johnie's Garage, Lee Center, Ill.

If the carbureter leaks when the engine is stopped, dirt has probably lodged under the float valve. If pressing down the priming button several times does not dislodge the dirt, unscrew the cap screw in the top of the float chamber and then give the float valve stem several turns with a screwdriver. If this does not remedy the trouble, shut off the supply of gasoline; then locate the exact cause of the trouble. It may be a leaky float, a poorly balanced float, poor seating of the float valve, a bent valve, too high a level of gasoline, a leaky joint where the gasoline line is connected, or a cracked spray nozzle.

The distance from the bottom nut on the float valve stem to the beginning of the seat of the stem should be $\frac{5}{8}$ in. for the carbureters with early type of electric vaporizer and $\frac{11}{16}$ in. for carbureters having late type. With this setting the level of the gasoline is $\frac{1}{32}$ in. below the spray nozzle opening. If it is necessary to grind in the float valve, do it by twisting the stem with a screwdriver and do not use grinding compound.

Architectural Service

IN giving architectural advice, MOTOR AGE claims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how

large it is expected to be.

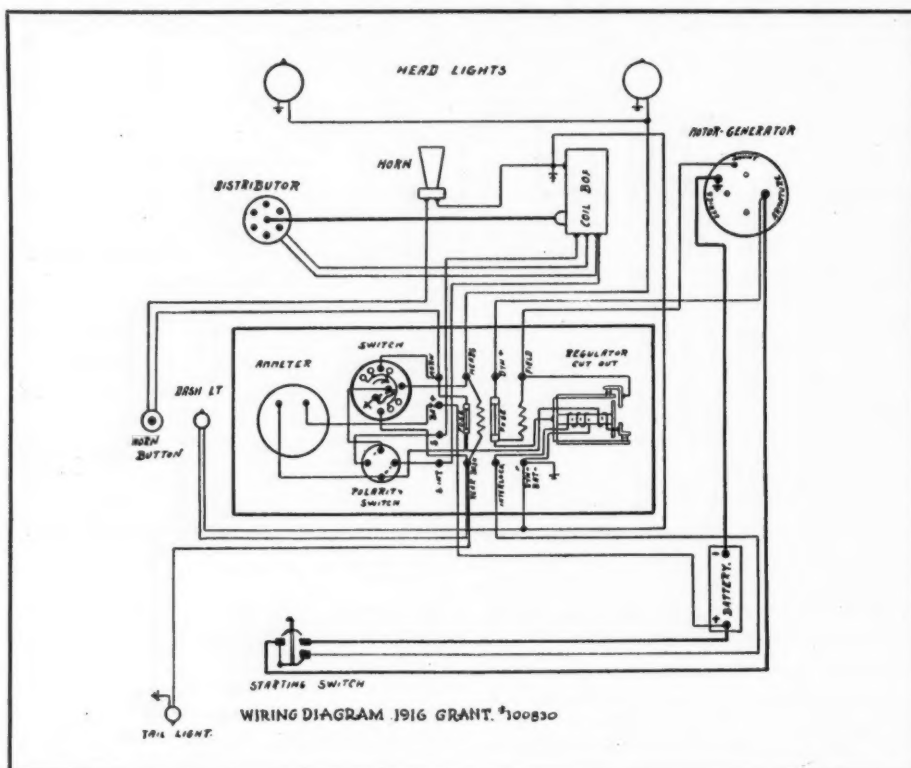
Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

Testing Allis-Chalmers System on Grant 1916



Q—We have a Grant car equipped with an Allis-Chalmers starting and lighting system, but although the starter works perfectly the generator part of this single unit system does not generate.—J. J. Stueff, Milton Junction, Wis.

1—The failure of the generator may be due to trouble in the fuses or wiring and it is well to first examine the large fuse in the instrument panel to make sure that it is not burned out and that it is making good contact with the clip. The wiring on the car should next be examined to make sure that all connections are sound. Look particularly at the small wire on the positive terminal of the battery and at the two small wires connecting to the motor generator and at the small wire leading to the starting switch.

If the fuse and wiring are all right the trouble must be in the auxiliary contact of the starting switch, in the regulator on the instrument panel, or in the motor generator itself. Try the following test, which should be of help in determining the cause of the trouble: With the engine running at about 600 r. p. m., or faster, take a small coin or length of wire and connect the terminal in the fuse compartment marked "interlock" to the lower clip of the large fuse. If this causes the ammeter to show a charge the trouble is due to a poor connection at the auxiliary contact in the starting switch.

The second test is on the motor generator. If the motor generator will start the engine with a charged battery but will not recharge the battery and the trouble has not been located by any of the above tests, the trouble is in either the shunt field of the motor generator or in the regulator. To test the shunt field; stop the engine and remove the

large fuse; then take a wire and bridge across from the wire marked "field" to either end of the small fuse. The ammeter should show a discharge of 3 to 4 amperes if the shunt field is all right.

The third test is to determine whether or not the regulator and cutout are working. If the shunt field tests out satisfactorily, replace the large fuse and start the engine and with it running at about 600 r. p. m. use a coin or wire to bridge the two terminals in the panel marked "field" and "dynamo plus." If this does not show charge on the ammeter use another coin or another piece of wire and connect the lower clip to the large and the small fuses. Bridging across at these two points cuts the regulator out altogether and this test must only be made with the engine running at about 600 r.p.m. When the engine is running too slowly there will be a heavy discharge, running too fast, there will be a heavy charge. If the ammeter gives no indication of charging current prior to these tests, but if after the test it shows charge it is proof that the regulator is at fault. If it is ever necessary to operate the car without the battery connected, the large fuse must be removed from its clip, otherwise the motor generator and regulator will be overheated and the lamps burned out if turned on.

VALVE TIMING ON CADILLAC 8

Q—We have a model 51-8 cylinder Cadillac. This car will do about 57 m.p.h. Give the exact valve timing of this car. We have it timed to close approximately 10 degs. late and the intake opens about 12 or 14 degs. late.—Wood & Schultz, Cerrito Gordo, Ill.

The correct valve timing should be as follows: Intake opens on upper dead

center and closes 46 degs. after bottom dead center. Exhaust opens 46 degs. before bottom dead center and closes on top dead center. As all of the cams are on one shaft you need only check one event, for example the closing of the exhaust valve on upper dead center will be sufficient.

If this car has not had new timing chains for a long period of time it is possible that this accounts for the limited speed obtainable.

It is also possible that incorrect tappet adjustment may account for reduction in speed. The adjustments of the intake and exhaust valves are made by means of screws in the cam slide. Turning an adjusting screw to the left (screwing it out) decreases the clearance between the end of the valve stem and the adjusting screw in the cam slide. Turning it to the right (screwing it down) increases the clearance. Due to the shape of the cam in type 51 engine, it is necessary to have the cams in a certain position to properly time the valves.

To place the cam in the right position to time the valve operated by that cam proceed as follows: Open the release cocks on the cylinders and crank the engine by hand until the valve that you are timing has just seated. Then turn the engine further by hand in the same direction 1½ in. on the flywheel. The cam is then in the correct position for timing the valve.

When the cam is in the proper position, the clearance between the end of the valve stem and the adjusting screw in the cam slide should be from .002 to .003 of an inch when the engine is cold. Each valve should be timed in this manner.

OFFSET PISTONS IN BUICK ENGINE HAVE ARROW POINTING TOWARDS CAMSHAFT

Q—On a Buick model K 45-6 cylinder car which way is correct to install pistons. Should the cotter pin which locks the piston pin be toward the front of the engine or toward the rear. Most pistons have arrows. Which way should the arrow point?

1—The arrow should point toward the camshaft which is on the right side of the engine and the cotter pin should be toward the front of the engine.

2—How should the pistons be installed in a D-45 Buick? Should the clamping bolt be toward the camshaft or on the opposite side and how should the arrows point?—N. L. Watson, Alton, Kan.

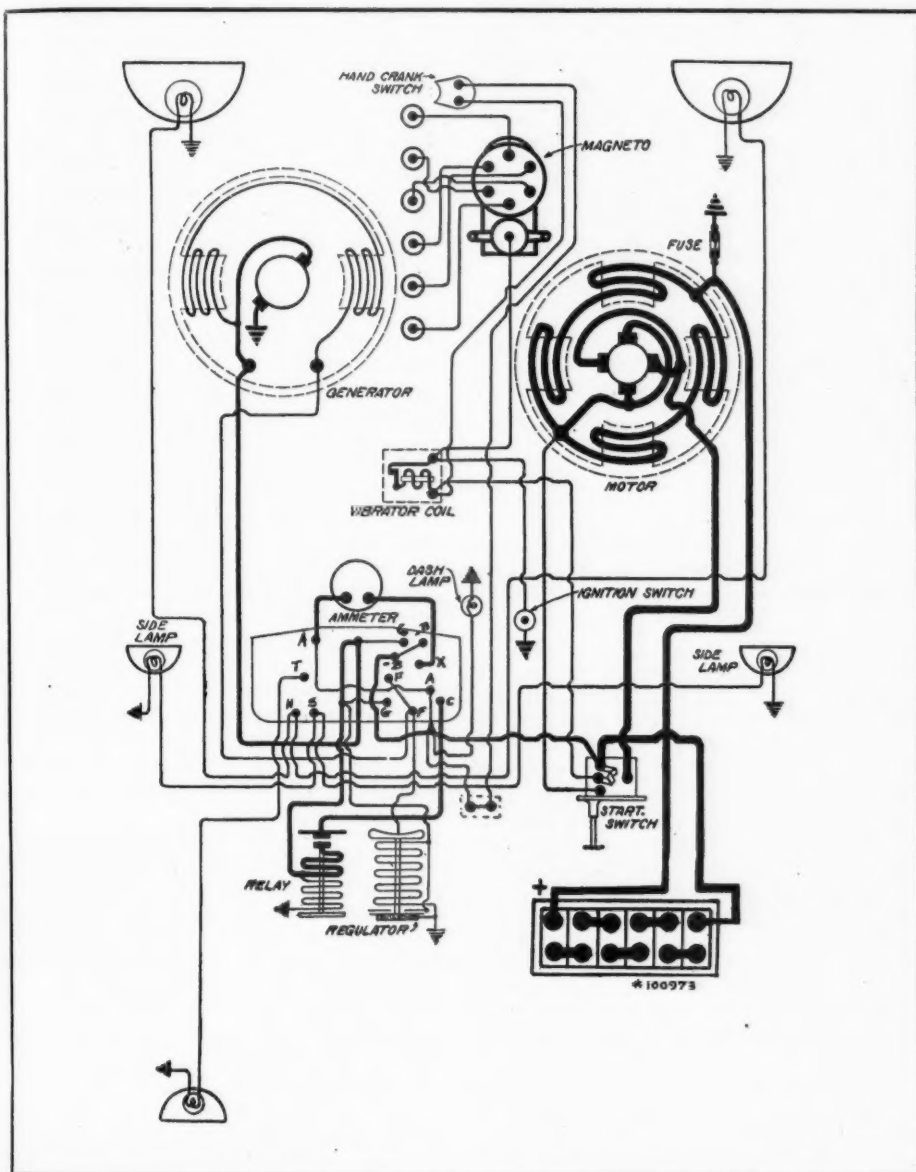
2—The arrows should point toward the camshaft and the clamp bolt should be on the side of the wrist pin away from the camshaft.

ENCLOSING STAMPS

Did you ever receive a letter and have the writer state that he "is enclosing stamps for return postage" and then try to get the stamps off of the letter? If you haven't then you're missing a fine chance to make "Squeeks & Rattles" with a "Favorite Agony." One letter like that once in a while is not so much of a "goat-getter" but to wrestle with fifteen or twenty a day—that's a job.

When you "enclose postage" for a reply, don't paste the stamps to the letter.

Diagram of Wiring on 1915 Model 41—Marmon



Q—We have a Marmon model 41, 1915 car in our shop and we are having trouble with the electrical system. The ammeter does not read and the generator will not show charge. Give wiring diagram and any suggestions you may have to offer.—George McWhinney, Chicago, Ill.

Diagram is shown in accordance with your request. The various switches are incorporated in a panel on the cowl board and on the diagram the various points of contact are marked. The brush connection from the live generator terminal is marked "G" and there are two such marks on the diagram for two contacts are shown there. From the generator circuit it will be seen that one end of the field connects to the live generator brush and the other end of the field comes to the panel board to terminals marked "F." Completion of the field circuit is taken care of through the regulator in which carbon is more or less compressed by magnetic effect.

One suggestion we have to offer is that it might be well to make a ground connection on the field terminal of the generator as this will temporarily eliminate

the regulator so that the machine will operate in case you have regulator trouble. The negative battery connection up in the panel is marked minus "B", connection from the right side of the ammeter is marked "X", and from the left side is marked "A", there being two of these A contacts. T stands for tail light, H stands for head light, S stands for side light.

The action of the ammeter switch must be such as to connect X to minus B in order that current may flow through the ammeter for lights. Current for the operation of the cutout will come from the generator up to the panel board and then down to the relay and through the fine winding to ground. In order that the generator may charge the battery there must not only be the ammeter connection from X to minus B but there must be a connection from A to C. Then when the cutout closes, current from the generator will flow to the panel board and down to the relay and through the heavy winding and across the contact to C. The circuit will then

be completed from C to A and through the ammeter to X then to minus B to battery.

Observation of the starting motor circuits will show that the ground connection is obtained through a fuse and if this is blown the generator cannot charge the battery.

A LITTLE MORE ADVANCE ALLOWABLE ON FORD SETTING OF 1915-1916 HUDSON

Q—We have for repairs a 1915 or 1916 Hudson touring car, engine No. 4983 equipped with a Delco ignition system, with which we are experiencing some difficulty. The distributor is supplied with two distinct primary circuit leads, also a dual set of breaker points with the usual operating mechanism.

No doubt one set is supplied for use with storage circuit while the other is supposed to use dry cells. The system is apparently an open circuit type. What we are now seeking is detailed advice on the correct method of timing the ignition for the most satisfactory operation of the engine.—E. B. Mertens, East Chicago, Ind.

One set of contacts, while made to appear like an interrupter, actually functions as a timer. When this pair of contacts closes, it completes a circuit for dry cell current through the ignition relay and the ignition coil. The ignition relay is nothing more or less than a master vibrator and the best thing you can do with it is to discard this portion of the circuit. This means that the buttons on the ignition switch, which are marked "Start" and "Bat." will no longer be used. The Start button is supposed to give a shower of sparks by means of the ignition relay and the ignition coil while the Bat. button is supposed to give a single spark, using the same unit.

The two terminals of the distributor that you will use are the two across which the condenser is connected. One of these terminals connects through ballast resistance coil to ground, and the other is the live terminal to which your ignition coil circuit will be connected. Operation of the "Mag" button really gives storage battery ignition.

The contacts that you will use and which, as stated, are connected across the condenser, really function as a closed circuit interrupter, although the construction is similar to that of an open circuit interrupter. If the surfaces are in poor condition, it may be necessary to have new contacts installed, both on the screw and on the contact arm. The timing will then be accomplished exactly the same as on one of the more recent cars having the points just begin to open when the piston is on firing dead center with levers in the retard position. In this interrupter mechanism there is some time lag at high speed, due to its construction, so that you can stand more advance than on later type. This information should enable you to time the engine and understand the system, but if additional information is required, we would be glad to hear from you again.

Motorcycle Engine Needs Thorough Inspection

Q—We have an Excelsior motorcycle of the one cylinder variety. We do not know how old it is but it is not nearly worn out yet. However, we are unable to make it develop any power. It is easy to start and the compression is good. We have a new spark plug in it and the magneto is all right. We have tried different timing, both for the valve and magneto. We have tried different carburetor adjustments and have tested for air leaks. The engine has no speed or power and a slight tightening of the belt is sufficient to slow it down very much even when up on the stand. The throttle must be open more than half way or the engine stops.

1—On an old engine of this kind it is quite likely that the cylinder is worn eccentric even if the compression seems to be good. We would accordingly suggest your taking the engine down and checking the clearance between the piston and cylinder walls with a thickness gage so as to determine whether it is out of round or not. You can also tell by inspecting the piston whether the explosion has been blowing by the rings or not as a burnt dark brown color will show where the explosion has been going by while a highly polished surface will show that rings and pistons are in good condition.

The fact that you have tried different timing for the valves and magneto would seem to lead to the possibility of the timing being incorrect. Exhaust valve should close on upper dead center approximately or perhaps a trifle after upper dead center. In regard to the magneto would say that you should have the interrupter points just beginning to break when the piston just goes over top dead center with the magneto set in retard. You can then advance the magneto for running, the exact amount being determined by experiment.

Another possibility is contained in the intake valve which operates by means of suction against a spring. It is possible that this spring is too weak and it would be well to install a new one.

Ammeter O. K. on Either 6 or 12 Volt Systems

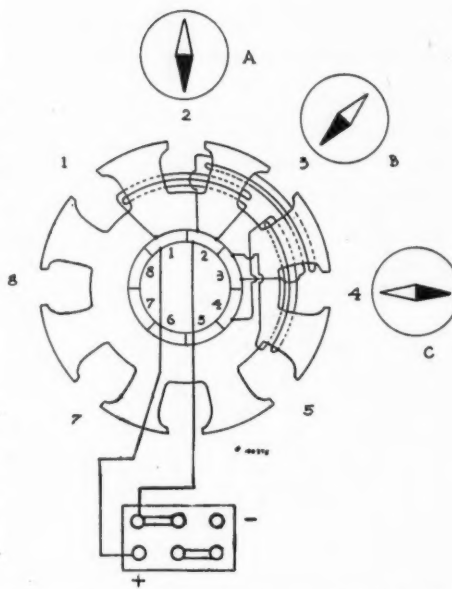
2—Is it possible to use an ammeter from a 6-volt system on a 12-volt system?

2—Yes. The voltage has nothing to do with the type of ammeter as a current of 6 amperes can be read on a 10 ampere meter regardless of whether it is a 6-volt system or a 110-volt system, assuming of course that in both cases you have direct current.

Charging a Battery with Water in it

3—When is a battery charged with distilled water in it?

3—This is usually done only when a battery has been allowed to become dry and sulphated. Under these circumstances it is necessary to drive out the sulphate, and distilled water is often used in place of electrolyte. It is however, usually necessary to put about 1 hydrometer full of acid in with the water in each cell in order to get the current started. Then as the battery is slowly charged the acid is driven out of the plates into the liquid which makes the acid stronger and stronger.



Compass needle reversal at "C" denotes wrong winding or wrong commutator connection

As the charge continues it may be necessary to dump the liquid out and put in fresh distilled water again. When the battery has been left on charge for a long period of time at a low rate and the plates have been brought back to a fairly good condition it is then possible to check up the electrolyte and see that it is about 1280.

Locating Reversed Armature Coil

4—How is an armature tested for reversed coils?

4—In the illustration given a simple armature is shown with its commutator. There is also shown a compass in three positions around the armature and a 6-volt battery with one cell connected to adjacent commutator bars on the armature. Three coils are shown. One goes in at slot 1 and out at 3, then in at 1 and out at 3 again. The next coil is wound in slot 2 and 4 and the other coil

is wound in slot 3 and 5. It will be seen that the first coil is connected to bars 1 and 2, the second coil to bars 2 and 3 and the third coil to bars 3 and 4. It will also be seen that while the first two coils are connected to the commutator bars in a certain way that the third coil has its connections reversed.

Accordingly if we test this armature for reverse coil we will find that connecting a battery to adjacent commutator bars produces a local magnetic effect. This same connection, it is true, sends current to all the other windings but the current is so much stronger in the one coil that the effect of this coil will predominate. By moving a compass around the armature, with the armature standing on end, a point will be found where the compass will point in toward the center of the armature.

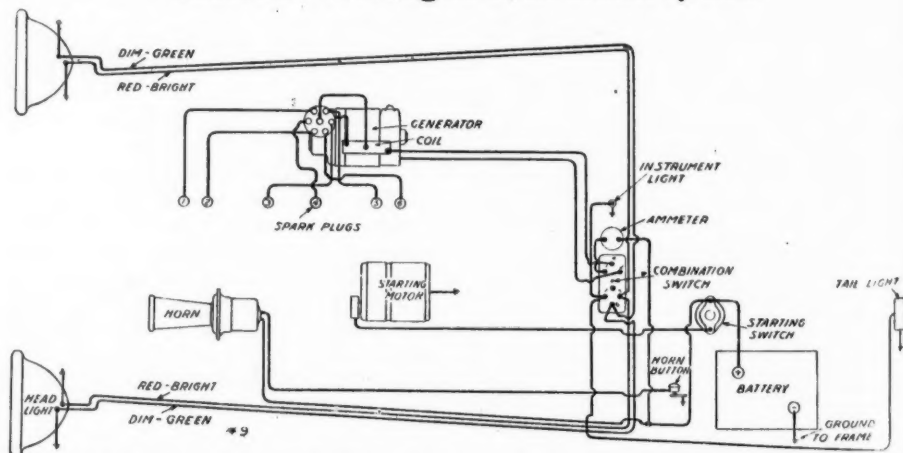
This test is made with the positive wire connected on bar 1 and the negative on bar 2. The compass location we will call A. Now change the battery connection so that the positive wire is on 2 and the negative on 3. Be sure that you follow these instructions accurately. Now move the compass to position B and the same end of the compass should point toward the armature. Now change the battery connection so that the positive wire is on 3 and the negative on 4. Now change the compass to position C.

If the same end of the compass continues to point toward the center of the armature, the direction of winding and connections are correct. However, should the compass reverse at position C as shown in the illustration, it would indicate that the coil being tested is reverse wound or reverse connected.

5—On the Dodge Brothers Northeast system, how is the high tension wire from the ignition coil disconnected?—Nebraska Subscriber.

5—This wire is set in the insulated piece and the whole insulated piece unscrews. Accordingly, turning it to the left will enable you to remove this high tension wire.

External Wiring of 1918 Liberty Six



Q—Send a complete wiring diagram of the 1918 Liberty car, using Red Seal Continental engine model 7 K, and also a diagram of the oiling system.—Apex Compensator Co., Indianapolis, Ind.

Wiring diagram of the car in question

is shown. A diagram of the oiling system on the 7-K engine is not available at this office and would suggest that you communicate with the Continental Motor Company, Detroit, Mich.

Difference in Coils Using Mechanical and Electrical Interrupters

Q—What is the difference between ignition coils used on cars such as Hudson, Buick or Oakland and the vibrating type of coil used on Ford cars? Is there a condenser in the Ford coil and if so where is it located and how connected?

1—There is no difference in the principle on which any of these coils operate. Low voltage current, usually from a battery, although sometimes from an alternating current generator or magnet as on a Ford car, is used through a winding called a primary to produce a magnetic effect. A pair of contacts serves to close and open the circuit for this current. When the contacts close, the current flows and produces magnetism in the iron core of the ignition coil. When the contacts separate the magnetism suddenly dies out and generates a high voltage in another winding which surrounds the primary.

This other winding is called the secondary and having many turns of fine wire produces a very high voltage, as the voltage produced by the various turns adds up. The more sudden the stopping of the primary current the greater will the voltage in the secondary be, and accordingly a condenser is connected across the interrupter contacts so as to absorb the arc and suddenly stop the primary current.

On cars such as Hudson, Buick, and Oakland and many others which you have not mentioned, these contacts are located in a separate unit called the distributor, the portion which operates the contacts being known as an interrupter. The action of a cam on a rotating shaft serves to break the circuit by opening the contacts at the right time.

On a Ford car the operation is the same in principle but different in detail. The magnetic effect of the coil is used to pull the points apart so that a vibrating action ensues. Therefore, instead of having a pair of contacts separated at a certain time, it is necessary on a Ford car to complete a circuit at a certain time. The device is therefore called a timer and closes the circuit instead of breaking the circuit when the spark is needed. Under these circumstances a shower of sparks, or series of sparks, will be produced in the cylinder instead of having a single spark. When the car is running however, the first spark of the shower or series presumably fires the gas and the additional sparks have no particular function. The Ford coil does contain a condenser which as in all ignition systems is connected across the contacts.

When Lights Get Dim

2—What causes the lights on a Dodge 1921 car to burn very brightly at road speeds of 10 or 15 m.p.h. and as soon as the car speed is increased to 20, 25, or 30 m.p.h. the lights nearly go out? This car has a new battery and we have tightened all connections and turned down the armature. We have also undercut same and sanded in the brushes.

2—The cause of the condition is possibly in turning down the commutator

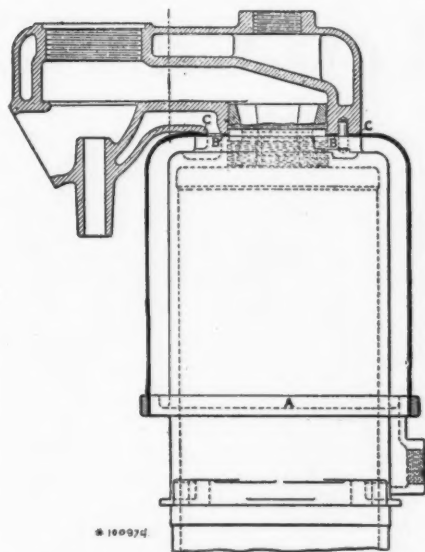


FIG. 44.—CADILLAC CYLINDER, WITH SHEET COPPER JACKET.

Removing individual cylinder heads from old style Cadillac

in such a way that it is not concentric with the bearings on which the armature rotates. If the commutator is slightly eccentric the brushes will be thrown off at high speed. We would suggest that instead of checking by the action of the lights that you would temporarily connect an ammeter in the circuit and watch its action at medium high speed. A battery always has a higher voltage when being charged than when no charging current is flowing and we think this possibly accounts for the lights getting dim at 25 or 30 m.p.h.

Action of Aluminum in Buick Push Rod

3—Why can the new Buick push rod, which has a section of aluminum in it, which metal expands greatly under heat, be adjusted closer than the old one, which was made entirely of steel? Why is it supposed to be noiseless?

3—With the conventional push rod on Buick cars there was expansion in the cylinder block and also in the push rods due to heat. However, as the cylinder block would be hotter than the push rod it would expand more. The rocker arm pivot being integral with the cylinder would accordingly be raised and would serve to lift the rocker arm. On account of the leverage however, or linkage ratio, the end of the rocker arm which normally actuates the valve stem would be raised more than the point at which the arm is pivoted.

The use of aluminum in the push rod has the effect of increasing the expansion per degree temperature rise. Accordingly if the cylinder block should get hot twice as fast as the push rod but the push rod should have twice the degree of expansion for this temperature rise we would have a sort of compensation so that the gap between the rocker arm and valve stem would remain practically constant.

This construction makes it possible to reduce the clearance between valve stem and rocker arm, while with the

previous construction the clearance might have been .003 inches when the engine was cold and would increase to possibly .010 inches when the engine was hot. You can accordingly see that with the small gap maintained under running conditions that the reduction in noise is easily accounted for.

Removing Cylinder Head on 1912 Cadillac

4—How can the top of the cylinder block on the 1912 Cadillac four cylinder engine be taken off so that we can put on new copper water jacket? We have been unable to move them with turpentine, heat and great leverage combined.

4—We are showing an illustration which gives a section through the cylinder block and cylinder head. The cylinder head is held to the block by a sort of bolt and nut, this bolt and nut being very short and of wide diameter, so that it amounts to a threaded collar. On each side of this bolt and nut or clamping device is a hexagonal socket into which a hexagonal bar must be set in order to unscrew the clamping collar. In order to loosen these clamping collars it is necessary to have the cylinder block off, as a hexagonal bar will have to be inserted through the cylinder bore and another hexagonal bar inserted through the opening in the cylinder head which is just above this clamping collar.

One suggestion is that you get a socket wrench which is just the right size to slip into this hexagonal opening and reinforce it by pouring in melted lead, so as to make it temporarily a hexagonal bar. The thread is left hand so that you will have to turn right hand in order to loosen the threaded collar.

It is quite likely of course that the threads are badly rusted and locked by carbon deposit so that before attempting to turn them right hand it might be well to take a drift and hammer and tap all around the edge of the clamping collar, both the one on top and the one underneath. Then if you are unsuccessful in loosening these collars, it might be well to get some acetone from the drug store and use it around the threads with the idea of dissolving the rust and carbon. It is possible that the difficulty experienced is due to lack of knowledge as to the construction and if this is the case our explanation should enable you to solve the problem.

CORRECT MICROMETER READING FOR .003 CLEARANCE

Q—What is the correct reading of micrometer on piston to fit a 3½ in. cylinder at .003 clearance? If a .005 feeler gauge can be placed fairly snug between piston and cylinder wall does it indicate .005 clearance?—B. Mickelson, Sioux City, Iowa.

The 3½ in. piston must be micrometered with a 3 to 4 in. micrometer, the reading on the micrometer for .003 over 3½ in. will be .503. If a .005 feeler gauge can be inserted snugly between piston and cylinder wall it indicates .005 clearance. If the pistons have not been purchased from the factory and have been turned from rough castings we would suggest that you check the ring lands to see if they have .008 to .012 less diameter than the piston skirt.

BOOSTING ACCESSORY SALES

GOOD advertising is working the downfall of the "gyp" tire and accessory dealer, slowly perhaps, but surely. The merchandise that you carry, if it is cheap, will sell but you will find few if any repeat orders. When you buy accessories, buy carefully. Buy only what your owners need and what you can sell.

The Thermalware Jar is announced by the Alladin Industries, Inc., 609 W. Lake street Chicago. The Thermalware Jar is of one gallon capacity and will keep foods or liquids hot or cold. It sells at \$5 and makes a handy container for supplies on a picnic trip. It has a heavy aluminum cap and a steel jacket which protects it against bumps and jars.

The Allyn-Zerk Company of Cleveland is marketing a pressure lubrication system. It operates on the pre-pressure principle with a direct metal contact between nozzle and nipple instead of a flexible hose or a rigid connection.

Each lubrication point is provided with a tapered nipple flat at the end, and drilled with a 1/16 inch hole to permit passage of lubrication to the bearing. The end of the nozzle itself is cupped. Because of this construction, the flattened end of the cone and the cupped end of the nozzle make a line contact which is grease-tight the instant they are pressed together. And this line contact is grease or oil tight even though the nozzle and nipple are not in exact line. The seal is effective at any angle within thirty degrees of the axis of the nipple.

Pressure is created in the barrel of the lubricator by turning the handle which is attached to the threaded plunger rod. This pressure flattens a curved steel spring which compresses the grease or oil, and at all times makes the emitting capacity equal, whether the lubricator is full or empty.

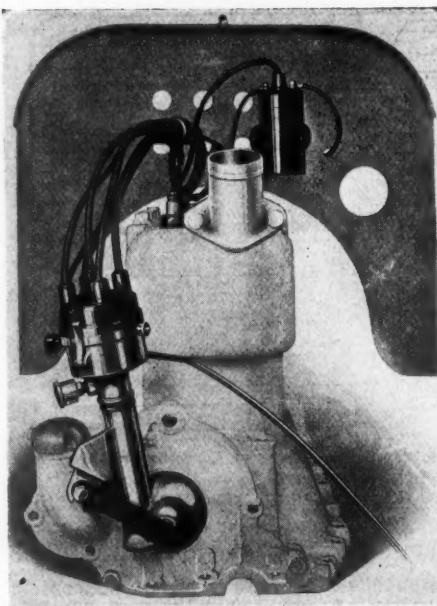
The nozzle of the Zerk Lubricator is designed to be leak proof. Pressure is held by a ball check seating against a steel line-contact seat.

To use the Zerk Lubricator it is only necessary to build up pressure by turning the handle, and then to press the nozzle firmly against the nipple. This pressure lifts the ball check in the nozzle and permits the instant flow of grease or oil under pressure through the nipple opening into the bearing.

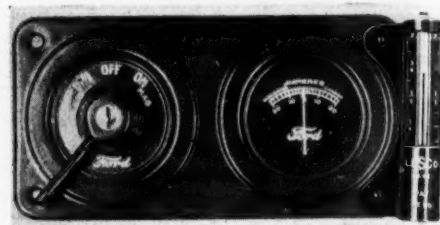
The Coleman Lamp Co., Wichita, Kans. is selling several pump models, one of which is shown on this page.

The Wells High Tension Distributor for Fordson tractors is announced by the Wells Mfg. Co., Fond du Lac, Wis.

Hays Hickory Hitters are manufactured by the J. M. Hays Wood Products Co., Jefferson City, Mo. They are made in all sizes for all makes of cars. A cut of the double bar type is shown on this page. This particular model sells for \$18.50.



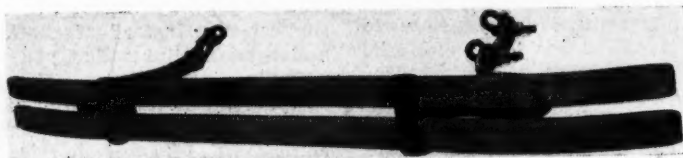
Bosch Ford ignition system



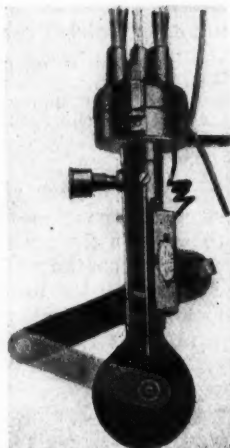
Lesco gasoline gage for Fords



Allyn-Zerk Lubricator



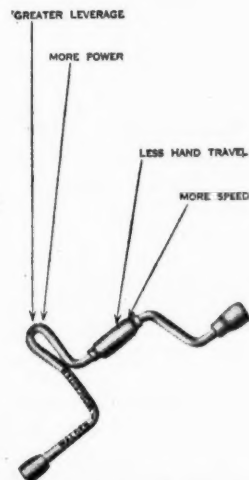
Hays hickory hitter.



Wells high tension distributor



Coleman pump



Walden-Worcester brace wrench

The Lesco Corporation, 1834 Broadway, New York has announced the Lesco Gasoline Gage for Fords to sell at \$2.50. The gage, as shown in the cut, attaches to the instrument board in plain sight of the driver.

The improvement in the Walden-Worcester new type double power brace wrench is illustrated in the cut. The wrench is made by Walden-Worcester, Inc., Worcester, Mass.

The Steerolite is made by the Steerolite Co., 1305 Maryland avenue, Baltimore, and attaches to the headlights of the car, making them movable with the

steering wheel. At present, they are being made for Ford cars only and are sold at \$15 installed.

The A. C. Spark Plug Co., Flint, Mich. announces a kit for carrying spare spark plugs. This kit is of metal and is made in Ford and other sizes.

The Type 600 Bosch Ignition System is for Ford cars and was announced by the American Bosch Magneto Corp. of Springfield, Mass., a few weeks ago. The cut shows this system's application to the car and it sells at \$12.75, or, if used with the Bosch coil, the cost of the outfit complete is \$18.75.

Portland Dealers' Association Survey Shows Attitude of Car Owners on Trade-Ins

RALPH J. STAEHLI, secretary of the Portland Automobile Dealers' Assn., Portland, Ore., recently completed a survey on what motor car buyers are interested in, whether they do business with the man who has a reputation for big trade-in values, or whether they do business with the man who has the car they want.

According to Staehli, buyers are, for the most part, at least, interested, if not sold, on some certain car before they go to a dealer's establishment. The man who is known as generous with his offerings for used cars seldom is considered by the new car buyers unless it happens that this dealer sells the car the buyer is interested in.

Staehli, in reporting on his investigation, which was carried on by the dealers' association, consisting of over 40 members, says:

"I felt that the particular dealer to whom I wanted to present my figures was too much afraid of the other fellow and too little inclined to sell the prospect his own merchandise. This man was devoting all his energies to buying used cars.

"His condition is probably paralleled elsewhere by dealers who think too much of what the other fellow is going to allow for the trade-in and not enough of the new car that Mr. Customer wants. These same dealers will advertise their wares in most progressive fashion. They will do everything in the line of good business to create a demand for their product and then, when they get to the critical point of profit-making, they forget all about their new car, which they want to hand to the customer, and begin speculating on what someone else is going to give for the old wreck the customer has to turn in."

Very often, the customer will tell the dealer who is trying to sell him a new car that some other dealer has offered him \$500 for his used car, when in reality it is not worth more than \$300. The dealer "falls" for this stuff and, without consulting the man supposed to have made the \$500 offer, takes the customer's word for it and gives him \$500 or \$550 for the old car.

The result? The "Used Car Problem."

Sell Him ON the New Car—Not Buy Him OFF the Old Car

Instead of spending so much time on the trade-in, if the dealer would go into detail on the new car, pointing out frankly to the customer where it is not profitable for him to enter into such a negotiation and selling him ON the new car, instead of buying him OFF the used car, the dealer and the customer would probably feel a great deal better about it.

There is no reason why a dealer should be afraid to say to a customer when the latter demands an unreasonable price for his old car, "I cannot give you your price because your car is not worth it." **THE DEALER IS THE AUTOMOBILE MAN, NOT THE CUSTOMER, AND THE DEALER KNOWS WHAT CARS ARE WORTH.**

But this is somewhat beside the point which is to show how the Portland association's secretary "checked up" on customers buying new cars and trading in old ones.

Staehli continues:

"In the Portland survey, reports of all calls made by customers were turned in to the association. Out of the first thousand, the following condition prevailed:

"Seventy-one per cent of all customers picked the car they wanted, had their dealer make them a price on the used car, and never showed up at any other agency before buying.

"Twelve per cent looked at two lines before making up their minds to have the dealer quote a price on their used car.

"Seven per cent would have been satisfied with any one of three lines and sold their used car to the highest bidder of the three.

"Four per cent showed their used car to four different dealers.

"Two per cent of the buyers went to five different dealers.

"One per cent went to six different dealers.

"One per cent went to eight different dealers.

"One per cent went to seven dealers before making up their minds.

"More than one-half of 1 per cent shopped at nine different agencies before being satisfied.

"A little less than half of 1 per cent went to 10 different dealers.

"A very few went to 11 and 12 different dealers, among them the City of Portland, which always buys on price alone, the price that it can get for the used car seemingly being the only consideration.

"Further reports have shown the situation to be substantially the same. The public is not nearly so much interested in what they can get for their used car as many dealers seem to think. According to these figures, it would appear that too often the idea of bargaining on the used car is put in the customer's head by the dealer himself. Naturally, when he learns how easy it is to force the hand of many dealers, he takes advantage of the situation and works one against the other to the very limit."

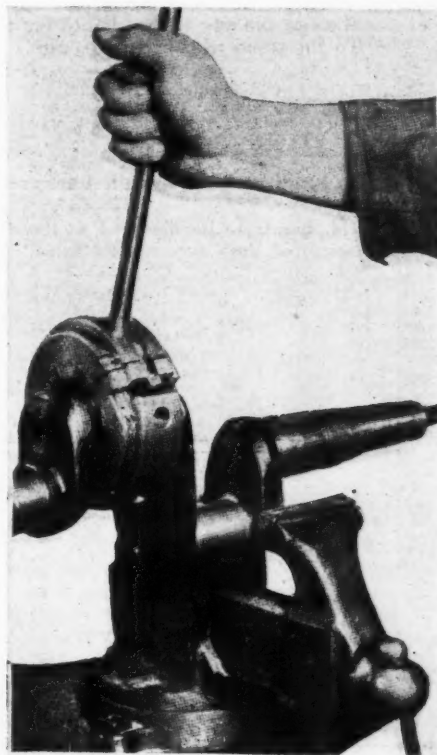
Smith Crankshaft Truing Tool

THIS tool consists of a frame equipped with cutters and an operating lever, by means of which the tool is rotated about the connecting rod bearing surface of a crankshaft.

To use the tool it is not necessary to remove the crankshaft from the engine. It is applied by loosening the swingbolt and opening the frame so that the tool will envelop the pin. After putting in place, the swingbolt is tightened slightly and the operator is then ready to true the pin by merely inserting the lever into holes in the periphery of the frame one after the other and causing the tool to rotate around and cut the pin until it is smooth.

As shown in the illustration, the lever is in one of these holes and two open holes, ready for the lever, are visible. Each pin can be trued in from 10 to 15 minutes, it is said.

This tool is made by the R. G. Smith Tool & Mfg. Co., 245-247 N. J. R. R. avenue, Newark, N. J.



COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Green Bay, Wis.	Annual Automobile Show	Aug. 27-30
Chicago	Commercial Vehicle Show	Sept. 1-7
Sacramento	Annual Automobile Show	Sept. 3-8
Memphis	Annual Automobile Show	Sept. 28-30
Fresno, Calif.	Automobile Show	Sept. 28-Oct. 5
Little Rock, Ark.	Annual Automobile Show	Oct. 8-13
Dallas, Texas	Annual Fall Show	Oct. 13-28
Washington, D. C.	Annual Fall Automobile Show	Oct. 28-31
Waco, Texas	Waco Automobile Dealers' Assn.	Oct. 20-Nov. 5
New York	Foreign Automotive Association Exposition	Nov. 4-10

RACES

Indianapolis	Annual 500 Mile International Sweepstakes	May 30
Tours, France	Grand Prix 500 Mile Race	July 2

CONVENTIONS

Spring Lake, N. J.	Summer Meeting of the Society of Automotive Engineers	June 19-23
Chicago	National Conference of Trade Association Secretaries and Managers under the auspices of the National Automobile Dealers' Assn.	July 23-24
Dixville Notch, N.H.	Summer Meeting of the Automotive Equipment Association	June 25-July 1
Olympia, Wash.	Convention Washington Automotive Trade Association	July
Mobile, Ala.	Semi-Annual Meeting of the Alabama Automotive Trades Association	July 23
Chicago	Exhibit and Convention of Automotive Equipment Association	Nov. 12-17

SQUEEKS & RATTLES

Squeeks & Rattles Club

Squeeks & Rattles Club is being organized for the purpose of killing off Old Joe Worry and his side kick, Tommy Gloom—are you with us? The single qualification for membership is to have your name appear on this page. If it has ever been printed here, let us know and we'll send you a card. But that's not all. In order to be a member in good standing, the dues must at all times be paid up, and the dues is at least one gloom chaser a week. Join the club!

A Bargain

"Oh, no," said the prospect,
"The price is too much,"
"All right," said the salesman,
"I'll throw in the clutch—
Sign here!"

—Red.

Guy advertises, "Monkey Glands for Flivvers." They're hard enough to keep out of the trees as it is.

She was only a banker's daughter—poor thing,
And only had four cars,
She lost the guy and a chance for a ring,
To the steno who had more cars.

"Front and center for the greasehound who suggested, 'The Worst Boner I Ever Pulled,'" says H. M. D. We second this, but what, oh, what has happened to 'Bonehead'? Why has he not sent us his contribution? Is he waiting until he does something?

Keep smiling—you'll like your food better.

J. R. H. wants to be directed to Bendix Drive. It is just two blocks south of the "Avenue to Sales" we read so much about.

The Gyp Victim

When forth 'mid sylvan scenes he
goes
A-speeding his machine,
He looks ahead and never knows
The beauties of the scene,
If clear and sunny be the day
He vows that he is glad—
But more than this he will not say—
He simply drives like mad.
And even when he stops awhile,
The green field spreading fair,
The blossom with its winsome smile,
Claim nothing of his care.
The sights which other men might
please
He turns not to admire.
He has no mind for things like these—
He has to mend a tire.—Washington Star

Editor Squkkes un rattles:
Dear Lew:

Enclosed is a clip-clip from your esteemed cotumbulary Motor West with an ad saying that the San Carlos, Cal. pageant has 50,000 sq. ft. of parking space for 50,000 cars. No wonder they have so many cars registered in Cal. if they are only 1 sq. ft. each.—Boob McNutt

Truthful

Irate Motorist—"Say, this darned car won't climb a hill! You said it was a fine machine!"

Dealer—"I said: 'On the level it's a good car.'"—Science and Invention.

Speaking of Trades

Sam's girl is tall and slender,
My girl is fat and slow;
Sam's girl wears silks and satins,
My girl wears calico.
Sam's girl is awful speedy,
My girl is pure and good;
Would I trade my girl for Sam's?
—You're darned right I would!

—"Kay Em" Roberts.

No One Would Deny It

"Mr. and Mrs. J. B. Van Doane are celebrating the arrival at their home of twin infants, a boy and a girl. Mr. Van Doane is an artist."—St. Louis Post-Dispatch.

Our Garage

A boiler and a kettle-lid,
Some plates that Maggie broke and hid,
A chopping-block, a knuckle-bone,
A phonograph that doesn't phone,
Some lingerie that lingered long,
A mattress with the mat all gone,
A bustle out of Grandma's trunk,
A rat-trap and some other junk,
A demijohn of faint bouquet
(Sweet hundred-proof of yesterday),
The sticks and tail of Johnnie's kite,
A table lamp I dropped one night,
Tomato cans of Auld Lang Syne,
A hundred feet of washing line,
One pair of pants (demobilized),
One garden hose (derubberized),
Gas-fittings from a former age,
One rocker, one canary cage,
A niblick and a baseball bat,
A bed stead and a broken slat,
The box in which the rabbit died,
The bike that Mother used to ride,
Of many things a sundry crop—
All but the car—that's in the shop.

—Lackawanna Motorist.

It Probably Wouldn't at Any Price

"\$275, cash or liberty bonds, buys the best 5-passenger car in the city for the money. It won't last long at this price."—Adv. in Des Moines Tribune.

Join Squeeks & Rattles Club!

That'll be about all for this week.—Lew Brication.

Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Ace.....30	1 1/2	\$2600	Mi-412	3 1/2 x 5	B-L	B-L	Ti-6560	WO	34x3 1/2	34x5 1/2
Ace.....40	2 1/2	3250	Mi-402	4 1/2 x 5 1/2	B-L	B-L	Ti-6460	WO	36x4 1/2	36x7 1/2
Ace.....60	3	3800	Mi-402	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4 1/2	36x8
Acme.....20	1 1/2	2034	Co-N	3 1/2 x 5	B&B	Cot	Ti-6250	WO	34x5 1/2	34x5 1/2
Acme.....30	1 1/2	2034	Co-N	3 1/2 x 5	B&B	Cot	Ti-6352	WO	34x3 1/2	34x5
Acme.....40	1 1/2	2034	Co-N	3 1/2 x 5	B&B	Cot	Ti-6460	WO	34x3 1/2	34x5
Acme.....60	2 1/2	2034	Co-N	3 1/2 x 5	B&B	Cot	Ti-6560	WO	36x4 1/2	36x7
Acme.....90	3 1/2	2034	Co-N	3 1/2 x 5	B&B	Cot	Ti-6660	WO	36x5	40x10
Acme.....125	5 1/2	2034	Co-N	3 1/2 x 5	B&B	Cot	Ti-6760	WO	36x6	40x12
Amer. La France	3 1/2	4950	Own	4 1/2 x 6	Own	Own	Own	WO	36x5	36x5
Amer. La France	5	5500	Own	4 1/2 x 6	Own	Own	Own	WO	36x6	40x6
Armleder.....20	1 1/2	2034	Bu-CTU	3 1/2 x 5 1/2	Ful	Ful	Ti-6460	WO	34x3 1/2	34x5 1/2
Armleder.....HWC	2 1/2	2034	Bu-CTU	3 1/2 x 5 1/2	Ful	Ful	Ti-6560	WO	36x4 1/2	36x7 1/2
Armleder.....HWC	2 1/2	2034	Co-C4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4 1/2	36x7 1/2
Armleder.....KWB	3 1/2	2034	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6666	WO	36x5 1/2	36x5 1/2
Armleder.....KWB	3 1/2	2034	Co-E4	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5 1/2	36x5 1/2
Atlas.....22	1 1/2	1495	Bu	3 1/2 x 5 1/2	M&E	Own	Own	WO	34x4 1/2	34x4 1/2
Atlas.....44	1 1/2	1950	Bu	3 1/2 x 5 1/2	M&E	Own	Own	WO	36x6	36x6
Atterbury.....20	1 1/2	2475	Co-J4	3 1/2 x 5	Ful	Ful	Ti-6460	WO	34x4 1/2	34x6
Atterbury.....22	2 1/2	3375	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4 1/2	36x4 1/2
Atterbury.....22	2 1/2	3375	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x5	40x6
Atterbury.....22	2 1/2	3375	Co-B2	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x7
Autocar.....21	1 1/2	2907	Own	4 1/2 x 5 1/2	Own	Own	DR	34x4	34x6	
Autocar.....27	2 1/2	3100	Own	4 1/2 x 5 1/2	Own	Own	DR	34x5	36x8	
Autocar.....27	2 1/2	3100	Own	4 1/2 x 5 1/2	Own	Own	DR	34x6	36x12	
Available.....HJ	1 1/2	2450	He-O	4 1/2 x 5	B-L	B-L	Ti-6460	WO	36x3 1/2	36x5
Available.....HJ	1 1/2	2450	He-CU3	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x8
Available.....HJ	1 1/2	2450	He-MU3	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5	40x5 1/2
Available.....HJ	1 1/2	2450	He-T3	5 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Avery.....1-1 1/2	1 1/2	1450	Co-N	3 1/2 x 5	Ful	Ful	To-OX2	IG	34x5 1/2	34x5 1/2
Bessemer.....G1	1 1/2	1995	Co-N	3 1/2 x 5	B&B	Bak	LM-7150	DR	36x3 1/2	36x5
Bessemer.....H2	1 1/2	2895	Co-C2	3 1/2 x 5	B&B	B-L	LM-7250	DR	36x4	36x4 1/2
Bessemer.....K2	1 1/2	3495	Co-E7	4 1/2 x 5 1/2	B&B	B-L	To-E	IG	36x5	36x10
Bethlehem.....KN	1-1 1/2	1385	Own	3 1/2 x 5	B&B	Det	Ea-3070	SB	35x5 1/2	35x5 1/2
Bethlehem.....GN	2-2 1/2	2185	Own	4 1/2 x 5 1/2	B&B	Det	Wi-90A	DR	34x4	34x6
Bethlehem.....HN	3-3 1/2	2985	Own	4 1/2 x 5 1/2	Ful	Ful	Wi-88E	DR	36x4	36x6
Brookway.....E2	1 1/2	1450	Wi-SU	4 1/2 x 5	B-L	B-L	Co-5200	SB	33x5 1/2	33x5 1/2
Brookway.....S1	1 1/2	1450	Wi-SU	4 1/2 x 5	B-L	B-L	Ti-6460	WO	36x4	36x6
Brookway.....K	2 1/2	2034	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4 1/2	36x8
Brookway.....K	2 1/2	2034	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x5	36x5 1/2
Brookway.....K	2 1/2	2034	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x7 1/2
Brookway.....K	2 1/2	2034	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x7 1/2
Case.....23-4-SD	3 1/2	945	Own	4 1/2 x 5 1/2	Own	Own	Own	SB	31x4 1/2	31x4 1/2
Case.....TR	2 1/2	575	Own	4 1/2 x 5 1/2	Own	Own	Own	SB	31x4 1/2	31x4 1/2
Chevrolet.....Sup'r	1 1/2	1450	Co-N	3 1/2 x 5	B&B	B-L	Ti-5511	SB	34x5 1/2	34x5 1/2
Clydesdale.....10	1 1/2	1450	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6460	WO	36x4	36x7
Clydesdale.....8 1/2	1 1/2	1450	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x5	36x5 1/2
Clydesdale.....6 1/2	1 1/2	1450	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6660	WO	36x6	40x6 1/2
Clydesdale.....4 1/2	1 1/2	1450	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x7	40x7 1/2
Clydesdale.....2 1/2	1 1/2	1450	Co-N	3 1/2 x 5	Det	Det	So-D16	SB	32x4 1/2	32x4 1/2
Commerce.....9 1/2	1 1/2	1450	Co-J4	3 1/2 x 5	B-L	B-L	Ti	WO	36x3 1/2	36x5 1/2
Commerce.....14 1/2	1 1/2	1450	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4 1/2	36x7 1/2
Commerce.....25 1/2	1 1/2	1450	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4 1/2	36x7 1/2
Corbett.....S 3/4	1 1/2	1250	HS-700	3 1/2 x 5	B-L	B-L	Sh-100	WO	34x4 1/2	34x4 1/2
Corbett.....E1	1 1/2	1480	Co-N	3 1/2 x 5	B-L	B-L	Sh-100	WO	34x4 1/2	34x4 1/2
Corbett.....C1	1 1/2	2170	Co-J4	3 1/2 x 5	B-L	B-L	Sh-150	WO	34x3 1/2	34x4 1/2
Corbett.....C2	1 1/2	2585	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Sh-103	WO	36x3 1/2	36x7 1/2
Corbett.....C3	1 1/2	2970	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Sh-21	WO	36x4 1/2	36x8
Corbett.....R3	1 1/2	3300	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Sh-21	WO	36x4 1/2	36x8
Corbett.....A 3 1/2	1 1/2	3900	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Sh-32	WO	36x5	36x10
Corbett.....AA5	1 1/2	4600	Co-B5	4 1/2 x 6	Del	Del	Sh-51	WO	36x6	40x12
Day-Elder.....AN	1 1/2	1600	Bu-WTU	3 1/2 x 5 1/2	B-L	B-L	Ti-6352	WO	34x3 1/2	34x4
Day-Elder.....BN	1 1/2	1980	Co-J4	3 1/2 x 5	B-L	B-L	Ti-6460	WO	34x5	34x5
Day-Elder.....DN	1 1/2	2390	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x7
Day-Elder.....FN	1 1/2	2390	Bu-HTU	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x8
Day-Elder.....FN	1 1/2	2390	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5	36x5 1/2
Day-Elder.....FN	1 1/2	2390	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6 1/2
Dearborn.....E1	1 1/2	1600	Bu-Mu	3 1/2 x 5 1/2	Ful	Ful	Wi	WO	35x5 1/2	35x5 1/2
Dearborn.....F1	1 1/2	1980	Bu-WU	3 1/2 x 5 1/2	Ful	Ful	Wi	WO	34x4	34x5
Dearborn.....48	1 1/2	2390	Bu-WU	3 1/2 x 5 1/2	Ful	Ful	Wi	WO	34x4 1/2	34x7
Defiance.....G1	1 1/2	1525	Co-N	3 1/2 x 5	B&B	G-L	Ea-1000	SB	35x5 1/2	35x5 1/2
Denby.....31 1/2	1 1/2	1485	Co-N	3 1/2 x 5	Ful	Ful	Cl-B300	SB	34x5 1/2	34x5 1/2
Denby.....33 1/2	1 1/2	2375	Co-J4	3 1/2 x 5	Ful	Ful	Cl-D	IG	35x5 1/2	35x7 1/2
Denby.....214	1 1/2	2945	Co-B5	4 1/2 x 6	Ful	Ful	Ru	IG	36x6	40x14
Denby.....353	1 1/2	2975	Co-K4	4 1/2 x 5 1/2	Ful	Ful	Cl-D2	IG	36x5	36x8
Denby.....271	1 1/2	3695	Co-L4	4 1/2 x 5 1/2	Ful	Ful	Cl-D3	IG	36x5	36x5 1/2
Denby.....2105	1 1/2	4295	Co-B5	4 1/2 x 6	Ful	Ful	Cl-D5	IG	36x6	40x6 1/2
Dependable.....CD	1 1/2	2350	Bu-CTU	3 1/2 x 5 1/2	Ful	Ful	Wi-800	WO	34x5	36x8
Dependable.....EG	2 1/2	2950	Bu-ETU	4 1/2 x 5 1/2	Ful	Ful	Wi-900C	WO	36x5	36x10
Diamond T.....O3	1-1 1/2	1450	Hi-700	3 1/2 x 5 1/2	Cov	Cov	Own	WO	36x3 1/2	36x4
Diamond T.....T1	1 1/2	1450	Hi-700	3 1/2 x 5 1/2	Cov	Cov	Ti-6160	WO	36x3 1/2	36x5
Diamond T.....U2	1 1/2	1450	Hi-1400	4 1/2 x 5 1/2	Cov	Cov	Ti-6560	WO	36x4 1/2	36x8 1/2
Diamond T.....L	1 1/2	1450	Hi-1500	4 1/2 x 5 1/2	Cov	Cov	Ti-6666	WO	36x5	36x5 1/2
Diamond T.....EL5	1 1/2	1450	Hi-200	4 1/2 x 5 1/2	Cov	Cov	Ti-6760	WO	36x6	40x6 1/2
Diamond T.....S5	1 1/2	1450	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6 1/2
Dodge Brothers.....K	1 1/2	750	Own	3 1/2 x 5 1/2	Own	Own	Own	SB	32x4 1/2	32x4 1/2
Dorris.....K-4	1 1/2	3400	Own	4 1/2 x 5 1/2	Own	Own	Ti-6560	WO	36x4	36x7
Dorris.....K-7 1/2	1 1/2	4400	Own	4 1/2 x 5 1/2	Own	Own	Ti-6660	WO	36x7	36x10
Dart.....103	1 1/2	685	Ly-K	3 1/2 x 5	Del	Own	FL-105	SB	31x4 1/2	31x4 1/2
Double Dr.....DFT3	1 1/2	4003	Bu-ETU	4 1/2 x 5 1/2	B&B	Own	Own	WO	36x6	36x6
Duplex.....G1	1 1/2	2034	Bu-WTU	3 1/2 x 5 1/2	B-L	B-L	Ti-5511	SB	33x5	33x5 1/2

*—Make Optional
†—Short wheelbase model
‡—6 cylinders
§—All 4 cyl. engines unless otherwise specified
||—Truck Tractor
h—Front wheel drive
b—price includes body or cab
d—dual
k—pneumatic tires optional
at extra cost
p—pneumatic tires standard

ENGINE:
Bu—Buda
Co—Continental
Do—Dodge
He—Hercules
Hi—Hinkley
HS—Hershey-Spillman
Ly—Lycoming
MI—Midwest
Wa—Waukesha
We—Weidner
Wi—Wisconsin

CLUTCH & GEARSET
H&B—Borg & Beck
B-L—Brown-Lipe
Bak—Baker
Cam—Campbell
Cot—Cotta
Cov—Covert
Det—Detlaft
Del—Detroit
Ful—Fuller
H-S—Hele-Shaw
Hoo—Hoosier
M&E—Merchant & Evans

REAR AXLE:
Am—American
Cl—Clark
Co—Columbia
Du—Durston
Ea—Eaton
Fl—Flint
LM—L-M

Mec—Mechanics
Mun—Muncie
T.D.—Twin Disc
War—Warner

Ru—Russell
Sa—Salisbury
Sh—Sheldon
Ti—Timken
To—Torben
Wa—Walker
Wi—Wisconsin
Ch—Chain
DR—Double Reduction
IG—Internal Gear
SB—Spiral Bevel
SP—Straight Bevel
WO—Worm

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Larrabee... X2	1-1 1/4	\$1865	Co-8R...	3 3/4 x 4 1/2	B-L.	B-L.	Sh-1480	SB.	34x5n	34x5n
Larrabee... J4	1 1/2-2 1/4	2400	Co-J4...	3 3/4 x 5	B-L.	B-L.	Sh-1501	WO.	34x3 1/2	34x5k
Larrabee... K5	2 1/2-3 1/4	3400	Co-L4...	4 1/2 x 5 1/2	B-L.	B-L.	Sh-22...	WO.	36x4	36x8
Larrabee... L4	3 1/2-4 1/2	4000	Co-L4...	4 1/2 x 5 1/2	B-L.	B-L.	Sh-31...	WO.	36x5	36x10
Maccar... H2	1 1/2		Co-K4...	4 1/2 x 5 1/2	B-L.	B-L.	Ti-6460	WO.	36x4	36x8
Maccar... H2 1/2			Co-K4...	4 1/2 x 5 1/2	B-L.	B-L.	Ti-6560	WO.	36x4	36x8 1/2
Maccar... H3			Co-L4...	4 1/2 x 5 1/2	B-L.	B-L.	Ti-6560	WO.	36x5	36x8 1/2
Maccar... M3 1/2			Co-L4...	4 1/2 x 5 1/2	B-L.	B-L.	Ti-6760	WO.	36x6	40x8
Maccar... G-5-6			Co-B2...	4 1/2 x 6	B-L.	B-L.	*Own. IG.		36x6	36x10
MacDonald... O-3-5		5500b	Bu-WTU	4 1/2 x 5 1/2	B-L.	B-L.	*Own. IG.		40x7	40x14
MacDonald... A-7 1/2		8000b	Bu-YTU	4 1/2 x 6	B-L.	B-L.	*Own. IG.		36x4	36x3 1/2
Mack... AB 1 1/2		3000	Own.	4x5	Own.	Own.	Own.	Ch.	36x4	36x3 1/2
Mack... AB 2		3450	Own.	4x5	Own.	Own.	Own.	Ch.	36x4	36x4
Mack... AB 2 1/2		3300	Own.	4x5	Own.	Own.	Own.	Ch.	36x4	36x4
Mack... AB 3		3750	Own.	4x5	Own.	Own.	Own.	Ch.	36x4	36x4
Mack... AB 3 1/2		3400	Own.	4x5	Own.	Own.	Own.	Ch.	36x4	36x4
Mack... AC 3		3850	Own.	4x5	Own.	Own.	Own.	Ch.	36x5	40x5
Mack... AC 3 1/2		4950	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x6
Mack... AC 5		5500	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x12
Mack... AC 6 1/2		5750	Own.	5x6	Own.	Own.	Own.	Ch.	36x7	40x7 1/2
Mack... AC 7 1/2		6000	Own.	5x6	Own.	Own.	Own.	Ch.	36x4	36x4 1/2
Mack... AB 5		3400	Own.	4x5 1/2	Own.	Own.	Own.	Ch.	36x5	40x5 1/2
Mack... AC 7		4950	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x6
Mack... AC 10		5500	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x12
Mack... AC 13		5750	Own.	5x6	Own.	Own.	Own.	Ch.	36x7	40x7 1/2
Mack... AC 15		6000	Own.	5x6	Own.	Own.	Own.	Ch.	36x7	40x7 1/2
Mason... 1 1/2		1200	Hc.	4x5	Hoo.	War.	FL.	SB.	34x5n	34x5n
Master... JW 1 1/2		2290	Bu-OU...	4 1/2 x 5 1/2	Ful.	Ful.	Ti-6460	WO.	34x4	34x5
Master... DD 2 1/2		3190	Bu-HU...	4 1/2 x 5 1/2	Ful.	Ful.	Wa-25A	IG.	34x4	36x8
Master... W 2 1/2		2790	Bu-HU...	4 1/2 x 5 1/2	Ful.	Ful.	Ti-6560	WO.	34x4	36x8
Master... A 3 1/2		3990	Bu-YTU	4 1/2 x 6	B-L.	B-L.	Ti-6666	WO.	36x5	40x5 1/2
Master... B 5		4990	Bu-ATU	4 1/2 x 6 1/2	B-L.	B-L.	Ti-6760	WO.	36x6	40x6 1/2
Master... F 5		5090	Bu-ATU	4 1/2 x 6 1/2	B-L.	B-L.	Wa-5A	IG.	36x6	40x6 1/2
Maxwell... 1 1/2		932	Own.	3 3/4 x 4 1/2	Own.	Own.	Own.	Own.	35x5n	35x5n
Menominee... B 1		1650	Wi-SU...	4x5	B&B.	Det.	Co-5200	SB.	35x5n	35x5n
Menominee... HT 1 1/2		2000	Wi-FAU...	4 1/2 x 5 1/2	Ful.	Det.	Wi-800G	WO.	34x3 1/2	36x5k
Menominee... H 1 1/2		2475	Wi-EAU...	4x5	Ful.	Det.	Wi-800H	WO.	34x3 1/2	36x5k
Menominee... D 2 1/2		2875	Wi-TAU...	4x5	Ful.	Det.	Wi-800J	WO.	36x4	36x8
Menominee... J 5		4850	Wi-RAU...	4 1/2 x 6	B&B.	Det.	Ti-6760	WO.	36x6	40x12
Moline... 10 1/2		1695	Own.	3 1/2 x 5	B&B.	Own.	To-A...	IG.	34x5n	36x6n
Moreland... R.R. 1 1/2		1595	Hc-O...	4x5	B-L.	B-L.	Ti-5512	WO.	34x5n	34x5n
Moreland... BX 1 1/2		1980	Hc-O...	4x5	B-L.	B-L.	Ti-6461	WO.	36x3 1/2	36x6
Moreland... EX 2		2625	Co-K4...	4 1/2 x 5 1/2	Own.	Own.	Ti-6461	WO.	36x4	36x8
Moreland... AX 3		3500	Co-L4...	4 1/2 x 5 1/2	Own.	Own.	Ti-6560	WO.	36x5	36x10
Moreland... RX 5		4600	Co-B5...	4 1/2 x 6	Own.	Own.	Ti-6666	WO.	36x6	40x12
Nash... 2018 1-1 1/4		1595	Own.	3 3/4 x 5 1/2	B&B.	Det.	CL-1D	IG.	34x4	34x5
Nash... 4017F 2-2 1/4		2750	Bu-HU...	4 1/2 x 5 1/2	B&B.	Own.	Own.	IG.	36x6	36x6
Nash... 3018 2-2 1/4		2150	Own.	3 3/4 x 5 1/2	B&B.	Det.	CL-2D	IG.	34x4	34x7
Nash... 5018 2 1/2		2250	Own.	3 3/4 x 5 1/2	B&B.	Det.	CL-2D	IG.	34x4	34x7
Noble... A-21 1-1 1/4		1750	Bu-MU...	3 3/4 x 5 1/2	Ful.	Ful.	Sh-1501	WO.	34x5n	34x5n
Noble... B-31 1 1/2		2395	Bu-CTU...	4 1/2 x 5 1/2	Ful.	Ful.	Sh-21	WO.	36x4	36x8
Noble... D-51 3 1/2		2795	Bu-HTU...	4 1/2 x 5 1/2	Ful.	Ful.	Sh-30	WO.	36x5	36x10
Noble... E-71 3 1/2		3495	Bu-YTU...	4 1/2 x 6	Ful.	War.	Sh-30	WO.	36x5	36x10
Old Reliable... B 2 1/2		3500	Wi-UAU...	4 1/2 x 6	Ful.	Ful.	Sh-21	WO.	34x4	36x8
Old Reliable... C 3 1/2		4250	Wi-UAU...	4 1/2 x 6	Ful.	Ful.	Sh-31	WO.	36x5	38x12
Old Reliable... D 5		5000	Wi-RAU...	4 1/2 x 6	Own.	Own.	Sh-51	WO.	36x6	40x12
Old Reliable... K 7 1/2		6000	Wa-P...	4 1/2 x 6 1/2	Own.	Own.	Own.	Ch.	36x6	40x14
Oldsmobile... T 1		1095	Own.	3 1/2 x 5 1/2	B&B.	War.	To-OX21	IG.	35x5n	35x5n
Oneida... B 1 1/2		2825	Hi-400...	4x5 1/4	Ful.	Ful.	Wi-800J	WO.	36x3 1/2	36x7
Oneida... C 2 1/2		3200	Hi-400...	4x5 1/4	Ful.	Ful.	Wi-900C	WO.	36x4	36x7
Oneida... D 3 1/2		4050	Hi-200...	4 1/2 x 5 1/2	Ful.	Ful.	Ti-6652	WO.	36x5	36x10
Overland... 4D 1 1/2		425	Own.	3 3/4 x 5 1/2	B&B.	Own.	Own.	SB.	30x3 1/2	30x3 1/2
Packard... EC 2-3		3100	Own.	4 1/2 x 5 1/2	Own.	Own.	Own.	WO.	36x4	36x7
Packard... EX 2 1/2		3500	Own.	4 1/2 x 5 1/2	Own.	Own.	Own.	WO.	36x6n	40x8n
Packard... ED 3-5		4100	Own.	4 1/2 x 5 1/2	Own.	Own.	Own.	WO.	36x5	36x5 1/2
Packard... EF 5-7		4500	Own.	5x6 1/2	Own.	Own.	Own.	WO.	36x6	40x8
Patriot, Revere... 1		1295	Co-N...	4x5	B&B.	Cov.	Du-B...	WO.	35x5n	35x5n
Patriot, Lincoln... 2		2400	Hi-100...	4x5 1/4	Cov.	Ful.	Ti-6560	WO.	34x4n	34x4n
Pat., Washington... 3		3000	Hi-200...	4 1/2 x 5 1/2	Cov.	Cov.	Wi-900	WO.	36x5n	36x8n
Pierce Arrow X52		3200b	Own.	4x5 1/2	Own.	Own.	Own.	WO.	36x4	36x8 1/2
Pierce Arrow W2 3 1/2		4350b	Own.	4 1/2 x 6 1/2	Own.	Own.	Own.	WO.	36x5	36x5 1/2
Pierce Arrow R105		4850b	Own.	4 1/2 x 6 1/2	Own.	Own.	Own.	WO.	36x5	40x6 1/2
Rainier... R31			Co-N...	3 3/4 x 5	B-L.	B-L.	Ti-6250	WO.	35x5n	35x5n
Rainier... R29 1			Co-N...	3 3/4 x 5	B-L.	B-L.	Ti-6250	WO.	34x3 1/2	34x4
Rainier... R36 1 1/2			Co-J...	4 1/2 x 5	B-L.	B-L.	Ti-6460	WO.	34x3 1/2	34x5
Rainier... R28 2-2 1/2			Co-K4...	4 1/2 x 5 1/2	B-L.	B-L.	Sh-103	WO.	34x4	34x7
Rainier... R20 2 1/2			Co-K4...	4 1/2 x 5 1/2	B-L.	B-L.	Ti-6560	WO.	36x4	36x8
Rainier... R25 3 1/2			Co-L4...	4 1/2 x 5 1/2	B-L.	B-L.	Ti-6666	WO.	36x5	36x5 1/2
Rainier... R27 6			Co-B5...	4 1/2 x 6	B-L.	B-L.	Ti-6760	WO.	36x6	40x6 1/2
Reo... F 1 1/4		1185	Own.	4 1/2 x 4 1/2	Own.	Own.	Own.	SB.	34x4 1/2	34x4 1/2
Republic... 75 3 1/4		1395b	Ly-KB...	3 3/4 x 5	Ful.	Ful.	To-750	IG.	33x5n	33x5n
Republic... 0E 1		1395	Co-N...	3 3/4 x 5	Ful.	Ful.	To-1000	IG.	34x5n	34x5n
Republic... 11X 1 1/4		1795	Co-J4...	4 1/2 x 5	Ful.	Ful.	To-CT2	IG.	34x3 1/2	34x6
Republic... 19W 2 1/2			Wa-FU...	4 1/2 x 5 1/2	Ful.	Ful.	To-CT2	IG.	36x4	36x7
Republic... 19 2 1/2		2195	Co-K4...	4 1/2 x 5 1/2	Ful.	Ful.	To-E...	IG.	36x5	36x5 1/2
Republic... 20 3 1/2		3095	Wi-CAU...	4 1/2 x 5 1/2	B-L.	B-L.	Sh-1501	WO.	36x6n	36x6n
Rowe... CW 1 1/2		3000	Wi-CAU...	4 1/2 x 5	B-L.	B-L.	Sh-103	WO.	34x5	36x3 1/2
Rowe... CDW 2 1/2		3300	Wi-CAU...	4 1/2 x 5	B-L.	B-L.	Sh-21	WO.	34x5	36x4
Rowe... GSW 3		4150	Wi-TAU...	4x6	B-L.	B-L.	Sh-21	WO.	34x6	36x5 1/2
Rowe... HW 4		4500	Wi-UAU...	4 1/2 x 6	B-L.	B-L.	Sh-31	WO.	36x7	36x8 1/2
Rowe... FW 5		4850	Wi-UAU...	4 1/2 x 6	B-L.	B-L.	Sh-51	WO.	36x7	40x6 1/2
Ruggles... 15 3 1/4		795	HS...	3 1/2 x 5	Own.	Own.	Co-5200	SB.	32x4 1/2	32x4 1/2
Ruggles... 20R 1 1/4		1295	Own.	4x5	B-L.	B-L.	Wi-65	DR.	34x5n	34x7
Ruggles... 40 2 1/2		1995	Own.	4x5	B-L.	B-L.	Wi-88F	DR.	36x4	36x8
Ruggles... 40H 2 1/2		2195	Own.	4x5	B-L.	B-L.	Sh-1501	WO.	34x3 1/2	34x5
Sandow... CG&G 1 1/2		\$1795	Co-N...	3 3/4 x 5	Ful.	Ful.	Ti-6560	WO.	36x4	36x7
Sandow... J 2 1/2		2750	Co-C4...	4 1/2 x 5 1/2	B-L.	B-L.	Ti-6560	WO.	36x4	36x7
Sandow... M 5		\$4325	Co-B5...	4 1/2 x 6	B-L.	B-L.	Ti-6760	WO.	36x6	40x12
Sandow... 10 3 1/4-1 1/4		1795	Co-8R...	3 3/4 x 4 1/2	B&B.	B-L.	Sh-1501	WO.	36x3 1/2	36x5n
Sandow... 15 1 1/2-2		2150	Co-N...	3 3/4 x 5	B-L.	B-L.	Sh-1501	WO.	36x3 1/2	36x5k
Sandow... 25 2 1/2-3 1/2		3050	Co-C4...	4 1/2 x 5 1/2	B&B.	B-L.	Sh-21	WO.	36x4k	36x4d
Sandow... 35 3 1/2-5		3750	Co-E4...	4 1/2 x 5 1/2	B&B.	B-L.	Sh-31	WO.	36x5	36x5 1/2
Sandow... 50 5-7		4550	Co-E4...	4 1/2 x 5 1/2	B&B.	B-L.	Sh-51	WO.	36x5	40x6
Schacht... 1 1/2		2500	Wi...	4x5	Ful.	Ful.	Wi...	DR.	36x3 1/2	36x7k
Schacht... 2 1/2		3200	Wi-UAU...	4 1/2 x 6	B&B.	Own.	Own.	WO.	36x4	36x7
Schacht... 3		3800	Wi-UAU...	4 1/2 x 6	B&B.	Own.	Own.	WO.	36x5	36x5 1/2
Schacht... 4		4400	Wi-UAU...	4 1/2 x 6	B&B.	Own.	Own.	WO.	36x5	40x5 1/2
Schacht... 5		4600	Wi-UAU...	4 1/2 x 6	B&B.	Own.	Own.	WO.	36x5	40x6 1/2
Schacht... 7		5050	Wi-UAU...	4 1/2 x 6	B&B.	Own.	Own.	WO.	36x6	40x7 1/2
Schwartz... A 1 1/4		1685	Ly-KB...	3 3/4 x 5	Ful.	Ful.	Ea-1000	SB.	34x4 1/2	34x4 1/2
Schwartz... B2W 2			Bu-CTU...	4 1/2 x 5 1/2	Ful.	Ful.	Sh-1501	WO.	34x3 1/2	34x6
Schwartz... C2W 3			Bu-HTU...	4 1/2 x 5 1/2	Ful.	Ful.	Sh-21	WO.	36x4	36x8
Schwartz... BW 5			Bu-YTU...	4 1/2 x 6	Ful.	Ful.	Sh-31	WO.	36x6	36x12
Selden... 30B 1 1/2			Co-N...	3 3/4 x 5	B-L.	B-L.	Ti...	WO.	34x3 1/2	34x5k
Selden... 50B 2 1/2			Co-K4...	4 1/2 x 5 1/2	B-L.	B-L.	Ti...	WO.	36x4k	36x7k
Selden... 53B 2 1/2			Co-L4...	4 1/2 x 5 1/2	B-L.	B-L.	Ti...	WO.	36x4k	36x7k
Selden... 70B 3 1/2			Co-L4...	4 1/2 x 5 1/2	B-L.	B-L.	Ti...	WO.	36x5k	36x10k
Selden... 90A 5			Co-B5...	4 1/2 x 6	Del.	B-L.	Ti...	WO.	36x6k	

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES	
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear				Make & Model	Final Drive	Front	Rear				
Walter.....N ²		\$3800†	Ow...	4x5 ¹ / ₂	B-L.	B-L.	Ow...	DR.	36x4	36x8											
Walter.....S ⁵		5100†	Ow...	4 ¹ / ₂ x6 ¹ / ₂	B-L.	War.	Ow...	DR.	36x6	40x6d											
White.....15	3 ¹ / ₂	2400	Ow...	3 ¹ / ₂ x5 ¹ / ₂	Ow...	Ow...	Ow...	SP.	34x5n	34x5n											
White.....20	2 ¹ / ₂	3250	Ow...	3 ¹ / ₂ x5 ¹ / ₂	Ow...	Ow...	Ow...	DR.	36x4	36x7d											
White.....40	3 ¹ / ₂	4200	Ow...	4 ¹ / ₂ x5 ¹ / ₂	Ow...	Ow...	Ow...	DR.	36x5	40x5d											
White.....45		4500	Ow...	4 ¹ / ₂ x5 ¹ / ₂	Ow...	Ow...	Ow...	DR.	36x6	40x6d											
Wilcox.....AA ¹	1 ¹ / ₂	1900	Bu-CTU	3 ¹ / ₂ x5 ¹ / ₂	B-L.	B-L.	Ru-3600	SP.	35x5	35x5											
Wilcox.....BB ¹	1 ¹ / ₂	2550	Ow...	4 ¹ / ₂ x5	B&B.	Ow...	Wa-2A.	DR.	36x6k	38x7k											
Wilcox.....CC ²	2 ¹ / ₂		Ow...	4 ¹ / ₂ x5	B&B.	Ow...	Wa-25A.	DR.	36x6k	40x8k											
Wilcox.....EE ³	3 ¹ / ₂	3550	Bu-YTU	4 ¹ / ₂ x6	M&E.	Ow...	Wa-5A.	DR.	36x5	36x10											
Wilcox.....F ⁵		4350	Bu-ATU	4 ¹ / ₂ x6 ¹ / ₂	M&E.	Ow...	Wa-5A.	DR.	36x5	40x5											
Wilson.....C ¹	1 ¹ / ₂	2270†	Co-J1	3 ¹ / ₂ x5	B&B.	Det.	Ti-6532.	WO.	34x5n	34x5n											
Wilson.....F ¹	1 ¹ / ₂	2825†	Co-K4	3 ¹ / ₂ x5	B&B.	Cot.	Ti-6460.	WO.	36x3 ¹ / ₂	36x5k											
Wilson.....EA ²	2 ¹ / ₂	3685†	Co-L4	4 ¹ / ₂ x5 ¹ / ₂	B&B.	Cot.	Ti-6560.	WO.	36x4k	36x7k											
Wilson.....G ³	3 ¹ / ₂	4520†	Co-B2	4 ¹ / ₂ x6	B&B.	Cot.	Ti-6660.	WO.	36x5k	36x5dk											
Wilson.....H ⁵							Ti-6752.	WO.	36x6k	40x6dk											
Yellow Cab. M22	3 ¹ / ₂	1590	Co-V4	3 ¹ / ₂ x5	B-L.	B-L.	Ti-6752.	SB.	33x4 ¹ / ₂	33x4 ¹ / ₂											
Yellow Cab. M42	1 ¹ / ₂	1640	Co-V4	3 ¹ / ₂ x5	B-L.	B-L.	Ti-6352.	WO.	35x5n	35x5n											

MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES	
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear				Make & Model	Final Drive	Front	Rear				
CANADIAN																					
Gotfredson.....20	3 ¹ / ₂ -4 ¹ / ₂	\$1685	Bu-WTU	3 ¹ / ₂ x5 ¹ / ₂	B-L.	B-L.	Ti-6250.	WO.	34x5n	34x5n											
Gotfredson.....40	1 ¹ / ₂ -2	2300	Bu-GTU	4x5 ¹ / ₂	B-L.	B-L.	Ti-6460.	WO.	36x6n	38x7n											
Gotfredson.....50	2 ¹ / ₂	3000	Bu-EtU	4 ¹ / ₂ x5 ¹ / ₂	B-L.	B-L.	Ti-6660.	WO.	36x4	36x8											
Gotfredson.....80	1	3975	Bu-YTU	4 ¹ / ₂ x6	B-L.	B-L.	Ti-6666.	WO.	34x5	36x12											
Gotfredson.....100	5	4800	Bu-BTU	5x6 ¹ / ₂	B-L.	B-L.	Ti-6760.	WO.	36x6	40x14											
Mapleleaf.....1 ¹ / ₂		3000	Hi-300	3 ¹ / ₂ x5 ¹ / ₂	Ful.	Ful.	Sh-1501.	WO.	34x5n	36x6n											
Mapleleaf.....AA ²	2	3600	Hi-400	4x5 ¹ / ₂	Ful.	Ful.	Sh-103.	WO.	36x4	36x7											
Mapleleaf.....BB ³	3	4050	Hi-500	4 ¹ / ₂ x5 ¹ / ₂	Ful.	Ful.	Sh-21.	WO.	36x4	36x4d											
Mapleleaf.....CC ⁴	4	4800	Hi-200	4 ¹ / ₂ x5 ¹ / ₂	Ful.	Ful.	Sh-31.	WO.	36x5	36x5d											
Mapleleaf.....DD ⁵	5	5625	Hi-1600.	4 ¹ / ₂ x5 ¹ / ₂	Ful.	Ful.	Sh-51.	WO.	36x6	36x6d											
National.....FA ¹	1 ¹ / ₂		Wa-BUX	3 ¹ / ₂ x5 ¹ / ₂	B-L.	B-L.	Ti-6352.	WO.	35x5n	35x5n											
National.....GA ^{1¹/₂}	1 ¹ / ₂		Wa-BUX	3 ¹ / ₂ x5 ¹ / ₂	B-L.	B-L.	Ti-6460.	WO.	34x4k	34x6k											
National.....HD ^{2¹/₂}	2 ¹ / ₂		Wa-CU.	4 ¹ / ₂ x5 ¹ / ₂	H-S.	B-L.	Ti-6560.	WO.	36x5	36x10											
National.....NB ^{3¹/₂}	3 ¹ / ₂		Wa-DU.	4 ¹ / ₂ x6 ¹ / ₂	H-S.	B-L.	Ti-6666.	WO.	36x6	40x12											
National.....OA ⁵	5	2699	Wa-EU.	5x6 ¹ / ₂	H-S.	B-L.	Ti-6760.	WO.	36x7	40x14											
Veteran.....M ^{1¹/₂}	1 ¹ / ₂		Bu-CTU	3 ¹ / ₂ x5 ¹ / ₂	B&B.	Cot.	Sh-1501.	WO.	34x5n	34x5n											
Veteran.....P ²	2	3699	Bu-HTU	4 ¹ / ₂ x5 ¹ / ₂	B&B.	Cot.	Sh.	WO.	36x4	36x7											
Veteran.....R ³	3	4200	Bu-HTU	4 ¹ / ₂ x5 ¹ / ₂	B&B.	Cot.	Sh-21.	WO.	36x4	36x7											
Veteran.....S ⁴	4	5395	Bu-YTU	4 ¹ / ₂ x6	B&B.	Cot.	Sh-31.	WO.	36x5	36x10											

Current Tractor Specifications

MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE			Belt Pulley, Dimensions Dia. & Face (Ins.)	Weight (Lbs.)	TRACTION MEMBERS		MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE			Belt Pulley, Dimensions Dia. & Face (Ins.)	Weight (Lbs.)	TRACTION MEMBERS	
				Make	No. of Cyls. Bore & Stroke	Recom. Fuel			Dimensions, Diameter & Face (Ins.)	Type Final Drive					Make	No. of Cyls. Bore & Stroke	Recom. Fuel			Dimensions, Diameter & Face (Ins.)	Type Final Drive
Allis-Chalmers...	6-12	1	\$295	LeR.	4-3 1/2 x 4 1/2	G....	10 x 5 1/2	2,500	48x 6	W	McCormick-Deering	10-20	2	\$785	Ow.	4-4 1/2 x 5	GKD.	15 1/2 x 7	3,700	42x12	W
Allis-Chalmers...	15-25	3	1185	Mid.	4-4 1/2 x 5 1/2	G....	12 1/2 x 6 1/2	4,700	46x12	W	McCormick-Deering	15-30	3	1250	Ow.	4-4 1/2 x 6	GKD.	16 1/2 x 8	5,750	50x12	W
Allis-Chalmers...	20-35	4	1885	Own.	4-4 1/2 x 6 1/2	GK.	13 x 7 1/2	6,150	50x12	W	Minneapolis	12-25	3		Ow.	4-4 1/2 x 7			6,600	56x12	W
Allwork.....D	20-38	4-5	1695	Own.	4-5 x 7	KD.	14 x 7 1/2	6,500	48x14	W	Minneapolis	17-30	3-4		Ow.	4-4 1/2 x 7			6,400	54x12	W
Allwork.....G	14-28	3	1495	Own.	4-4 1/2 x 6	KD.	11 x 7	4,800	48x12	W	Minneapolis	22-44	4-5		Ow.	4-6 x 7			12,410	62x20	W
Allwork.....C	16-30	3	1293	Own.	4-5 x 6	KD.	13 1/2 x 7 1/2	5,200	48x12	W	Minneapolis	35-70	8-10		Ow.	4-7 1/2 x 9			22,500	85x30	W
Aultman-Taylor...	15-30	3-4	1900	Cl.	4-5 x 6 1/2	GKD.	20 x 8	7,800	70x12	W	Moline (Un.) D3	9-8	2-3	725	Ow.	4-3 1/2 x 5	G....	9 x 6 1/2	4,103	52x 8	W
Aultman-Taylor...	22-45	4-6	3100	Own.	4-5 1/2 x 8	GKD.	20 x 11	12,500	70x20	W	Moline (Orc.) D	9-8	2-3	725	Ow.	4-3 1/2 x 5	G....	9 x 6 1/2	3,893	44x 8	W
Aultman-Taylor...	30-60	8-10	4400	Own.	4-7 x 9	GKD.	24 x 11	22,500	90x24	W	Monarch	C-20	3-4	3,700	Bea.	4-4 1/2 x 6	GK.	16 x 8 1/2	8,700	*66x12	T
Avery.....15	3-4	8-10		Ow.	4-4 1/2 x 6	GKD.	16 x 7 1/2	4,750	50x12	W	Monarch	E-25	40	4,200	Bea.	4-4 1/2 x 6	GK.		12,000	*67x12	T
Avery.....20-35	20-35	4-5		Ow.	4-4 1/2 x 7	GKD.	16 x 7 1/2	7,500	60x16	W	Monarch	D-35	60	5,500	Bea.	4-4 1/2 x 6	GK.		15,000	*89x12	T
Avery.....25-50	25-50	5-6		Ow.	4-6 1/2 x 7	GKD.	22 x 8 1/2	12,500	69x20	W	Nichols-Shepard	20-42	4-6	2,600	Ow.	2-8x10	GK.	22 x 8	13,500	64x20	W
Avery.....45-65	45-65	8-10		Ow.	4-7 1/2 x 8	GKD.	26 x 10	22,000	87 1/2 x 24	W	Nichols-Shepard	25-50	6-8	3,320	Ow.	2-9x12	GK.	24 x 9	20,500	69x28	W
Avery, Tr. Runner	15-30	3		Ow.	4-4 x 5 1/2	GKD.	12 x 6 1/2	5,000	x 8 1/2	W	Nichols-Shepard	35-70	8-12	4,030	Ow.	2-10 1/2 x 14	GK.	30 x 12	30,000	73x32	W
Avery, RoadRazer	15-25	3		Ow.	6-3 x 4	G....	None.	4,600	42x 6	W	Pioneer	18-36	4		Ow.	4-5 1/2 x 6	GK.		6,500	60x18	W
Bates (St. Mule) H	15-25	3		Mid.	4-4 1/2 x 5 1/2	G....	12 x 8 1/2	3,600	48x10	W	Pioneer	41-75	10		Ow.	4-7 x 8	G....	17 1/2 x 15	24,000	96x24	W
Bates (St. Mule) F	18-25	3		Mid.	4-4 1/2 x 5 1/2	G....	12 x 8 1/2	4,850	*56x10	T	Rumely OilPull	12-20	3		Ow.	2-6 x 8	KD.	19 x 7	6,682	51x12	W
Bates (St. Mule) G	25-35	4		Mid.	4-4 1/2 x 6	G....	12 x 8 1/2	6,500	x10	T	Rumely OilPull	16-30	4		Ow.	2-7 x 8 1/2	KD.	23 x 8 1/2	9,600	56x16	W
Bates (St. Mule) Q	30-40	4		Mid.	4-4 1/2 x 6	GD.	12 x 8 1/2	8,500	*84x10	T	Rumely OilPull	20-40	6		Ow.	2-8 x 10	KD.	26 x 9	12,820	64x20	W
Best.....B	25-35	4	4250	Ste.	4-4 1/2 x 6 1/2	GKD.	12 x 9	5,500	*64x12	T	Rumely OilPull	30-60	8-10		Ow.	2-10 x 12	KD.	36 x 11	26,700	80x30	W
Best.....30	20-30	4		Ow.	4-4 1/2 x 6 1/2	GKD.	12 x 8	8,100	*68x11 1/2	T	Russell	15-30	3-4		Cl.	4-5 x 6 1/2	GK.	12 1/2 x 7	6,000	56x14	W
Best.....60	40-60	9		Ow.	4-6 1/2 x 8 1/2	GKD.	16 x 10	18,580	*89x20	T	Russell	20-40	4-5		Cl.	4-5 1/2 x 7	GK.	12 1/2 x 8	7,900	60x16	W
Bryan.....Steam	15-30	3	2500	Ow.	2-4 x 5	KD.	18 x 7	5,500	52x12	W	Russell	30-60	8-10		Ow.	4-8 x 10	GKD.	24 x 10	22,550	84x22	W
Case.....12-20	12-20	3	1095	Ow.	4-4 1/2 x 5	GKD.	14 1/2 x 6 1/2	4,230	42x12	W	Shaw-Enochs (Gr.)	.....	.....		LeR.	4-3 1/2 x 4 1/2	G....	None	4,400	48x 8	W
Case.....15-27	15-27	3-4	1350	Ow.	4-4 1/2 x 6	GKD.	16 x 6 1/2	6,600	52x14	W	Stinson	4-E	18-36	1,635	Bea.	4-4 1/2 x 6	GKD.	12 x 8	7,100	60x12	W
Case.....22-40	22-40	4-5	2650	Ow.	4-5 1/2 x 6 1/2	GKD.	16 1/2 x 8 1/2	10,700	56x16	W	Topp-Stewart	B-30	45		Wau.	4-4 1/2 x 6 1/2	GKD.		7,800	42x12	W
Case.....40-72	40-72	8-10	4900	Ow.	4-7 x 8	GKD.	19 1/2 x 10 1/2	21,200	72x20	W	Toro.....6	10-20	2-3	800	Ow.	2-6 1/2 x 7	GKD.	18 x 7	4,500	48x12	W
Caterpillar. 2 Ton	15-30	3	1975	Ow.	4-4 x 5 1/2	G....	11 1/2 x 6 1/2	4,000	.....	T	Townsend	15-30	3-4	1,350	Ow.	2-7 x 8	GKD.	20 x 8	6,500	56x18	W
Caterpillar. 5 Ton	25-40	4	3975	Ow.	4-4 1/2 x 6	G....	12 x 8 1/2	9,400	.....	T	Townsend	25-50	4-8	2,500	Ow.	2-8 1/2 x 10	GKD.	22 x 10	11,500	60x24	W
Caterpillar. 10 Ton	40-60	6	6050	Ow.	4-6 1/2 x 7	G....	14 x 10 1/2	19,500	.....	T	Taylor.....6	12-20	3	1200	Ow.	4-4 1/2 x 6	GKD.	16 x 6 1/2	5,000	50x12	W
Cletrac.....F	9-16	2	745	Ow.	4-3 1/2 x 4 1/2	GK.	7 x 5	1,930	*42x 5 1/2	T	Twin City	20-35	5	2750	Ow.	4-5 1/2 x 6 1/2	GKD.	21 x 8 1/2	9,200	60x20	W
Cletrac.....W	12-20	2	1,345	Ow.	4-4 x 5 1/2	GK.	8 x 6	3,455	*48x 8	T	Twin City	40-65	8	4750	Ow.	4-7 1/2 x 9	GKD.	23 x 10 1/2	24,000	84x24	W
Eagle.....F	12-22	3		Ow.	2-7 x 8	G....		5,850	48x12	W	Uncle Sam. C-20	12-20	2-3	990	Wei.	1-1 x 5 1/2	GK.	16 x 6	3,000	46x12	W
Eagle.....H	16-30	4		Ow.	2-8 x 8	G....		9,100	48x12	W	Uncle Sam. B-19	20-30	3-4	1,535	Bea.	4-4 1/2 x 6	GKD.	11 x 9 1/2	4,650	50x12	W
E-B.....AA	12-20	3		Ow.	4-4 1/2 x 5	GK.	12 x 6 1/2	4,550	54x12	W	Uncle Sam. D-21	20-30	3-4	1,485	Bea.	4-4 1/2 x 6	GKD.	11 x 9 1/2	4,600	50x12	W
E-B.....Q	12-20	3		Ow.	4-4 1/2 x 5	GK.	12 x 8	6,500	60x12	W	Wallis.....OK	15-27	3		Ow.	4-4 1/2 x 5 1/2	GKD.	18 1/2 x 7	3,630	48x12	W
E-B.....16	36-42	3		Ow.	4-5 1/2 x 7	GK.	16 x 9	9,400	72x16	W	Waterloo Boy. N	12-25	3		Ow.	2-6 1/2 x 7	GKD.	14 x 8	5,869	52x12	W
Fagool.....19	12-22	2	1175	Lyc.	4-3 1/2 x 5	G....		3,600	48x 8 1/2	W	Wetmore.....N	12-25	3	1,185	Wau.	4-4 x 5 1/2	GK.	12 x 7	2,900	46x10	W
Fordson.....39	30-40	2	3950	Ow.	4-4 x 5	K....	9 1/2 x 6 1/2	2,543	42x12	W	Wisconsin.....16	16-30	3-4	1,750	Cl.	4-5 x 6 1/2	GK.	16 x 8	5,600	52x12	W
Frick.....A	12-20	2	1000	Erd.	4-4 x 6	GK.	13 x 7	5,800	60x10	W	Wisconsin.....22	22-40	4-5	2,550	Cl.	4-5 1/2 x 7	GK.	16 x 9	7,500	52x12	W
Frick.....C	15-28	3	1600	Bea.	4-4 1/2 x 6	GK.	13 x 7	6,730	60x12	W	Yuba. (Ball Tread)	15-25	3	2,750	Wis.	4-4 1/2 x 6	D....	12 x 6 1/2	5,750	*36x12	T
Gray.....DU	18-36	4	2150	Wau.	4-4 1/2 x 6 1/2	G....		6,200	54x54	Dr	Yuba. (Ball Tread)	25-40	6	4,250	Wis.	4-5 1/2 x 7	D....	12 x 8 1/2	10,130	*48x17 1/2	T
Gray.....EU	22-40	4	2385	Wau.	4-5 x 6 1/2	G....	10 x 8	6,900	54x51	Dr											
Hart-Parr.....20	-20	2		Ow.	2-5 1/2 x 6 1/2	K....	13 x 6 1/2	3,973	46x10	W											
Hart-Parr.....30	-30	3		Ow.	2-6 1/2 x 7	K....	14 x 8 1/2	5,220	52x10	W											
Hart-Parr. (Road)	-30	3		Ow.	2-6 1/2 x 7	K....	14 x 8 1/2	7,560	52x18	W											
Heider.....D	9-16	2		Wau.	4-4 1/2 x 5 1/2	K....	12 x 6	4,000	54x 8	W											
Heider.....C	12-20	3		Wau.	4-4 1/2 x 6 1/2	GK.	14 x 7	6,000	57x10	W											
Heider.....M	5-10	1		LeR.	4-3 1/2 x 4 1/2	G....	8 x 5	2,800	46x 6	W											
Huber.....(Light 4)	12-25	3	985	Wau.	4-4 1/2 x 5 1/2	GK.	13 x 7	5,000	60x10	W											
Huber.....(Super 4)	15-30	3		Mid.	4-4 1/2 x 6	G....		6,000	60x10	W											
LaCrosse.....M	6-12	1		Ow.	2-4 x 6	G....		3,000	48x 7	W											
LaCrosse.....H	12-24	3		Ow.	2-6 x 7	G....		3,800	58x10	W											
Lauson.....S	12-25	3		Mid.	4-4 1/2 x 5 1/2	G....		4,200	.....	W											
Lauson.....T	15-30	4		Bea.	4-4 1/2 x 6	GKD.		6,200	.....	W											
Leader.....B	12-18	2		Ow.	2-3 1/2 x 6	GK.	14 x 7	4,800	50x12	W											
Leader.....N	16-32	3-1		Cl.	4-5 x 6	GK.	14 x 7 1/2	5,930	52x12	W											
Leader.....GU	16-32	3-1		Cl.	4-5 x 6	GK.	14 x 7 1/2	*66x 9	T												
Lincoln.....A	15-30	3	1,600	Bud.	4-4 1/2 x 6	GK.	12 x 7	5,000	40x14	W											
Little Giant.....B	16-22	4		Ow.	4-4 1/2 x 5	GK.	10 x 7	5,200	54x14	W											
Little Giant.....A	26-35	6		Ow.	4-5 1/2 x 6	GK.	13 1/2 x 9	8,700	66x20	W											
Lombard.....10	12-16			Ow.	6-5 1/2 x 7	G....		19,000	x12	W											
London.....12	25-35	3		Mid.	4-4 1/2 x 5 1/2	G....		48x12	.....	W											

GARDEN TRACTORS																					
MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE			Belt Pulley, Dimensions Dia. & Face (Ins.)	Weight (Lbs.)	TRACTION MEMBERS		MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE			Belt Pulley, Dimensions Dia. & Face (Ins.)	Weight (Lbs.)	TRACTION MEMBERS	
				Make	No. of Cyls. Bore & Stroke	Recom. Fuel			Dimensions, Diameter & Face (Ins.)	Type Final Drive					Make	No. of Cyls. Bore & Stroke	Recom. Fuel			Dimensions, Diameter & Face (Ins.)	Type Final Drive
McCormick-Deering	10-20	2	\$785	Ow.	4-4 1/2 x 5	GKD.	15 1/2 x 7	3,700	42x12	W	McCormick-Deering	15-30	3	1250	Ow.	4-4 1/2 x 6	GKD.	16 1/2 x 8	5,750	50x12	W
Minneapolis	12-25	3		Ow.	4-4 1/2 x 7			6,600	56x12	W	Minneapolis	17-30	3-4		Ow.	4-4 1/2 x 7			6,400	54x12	

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

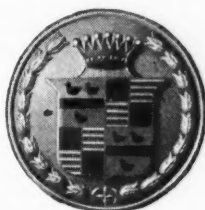
PRICES						Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM			Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE	
OPEN MODELS			CLOSED MODELS						Make	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make				Type and Make	Type and Make	Type and Make	Gear Ratio
\$1950c	\$1785	\$1850	\$1885c	\$2250	\$2485	127	33x4 1/2	American.....D-66	H-S.....	6-3 1/2x5	29.40	Strom.	G-D.....	A-K.....	s-p B&B.....	B & B.....	m Hartford.	F Salis.....	4.50
	1650					127	33x4	American.....Steamer	Own.....	2.....	None	L-N.....	L-N.....	None	None	None	f Universal.	1/2 F Salis.....	1.75
	1195				1450d	114	32x4	Anderson.....41	Cont.....	6-3 1/2x4 1/2	23.44	Zenith.	West.....	s-p B&B.....	Durston.	f Universal.	1/2 F Salis.....	4.75	
1495	1495	1595	1785b	1995c	1995d	122	32x4	Anderson.....Series 50	Cont.....	6-3 1/2x4 1/2	27.34	Rayfield.	Remy.....	s-p B&B.....	Durston.	f Universal.	1/2 F Salis.....	4.62	
			1915c			132	33x4	Anderson.....Series 50	Cont.....	6-3 1/2x4 1/2	27.34	Rayfield.	Remy.....	s-p B&B.....	Durston.	f Universal.	1/2 F Salis.....	4.62	
	1535				2200	120	32x4	Apperson.....6	Own.....	6-3 1/2x4 1/2	23.44	Strom.	Remy.....	s-p Rockford	Mech.....	m Thieme.	1/2 F Col.....	5.10	
	2800	2900		3625	3750	\$3850	130	33x5	Apperson.....8-23-S	Own.....	8-3 1/2x5	33.80	Johnson.	Bijur.....	m-d Own.	Own.....	m Thieme.	1/2 F Own.	4.28
	1165		1275d		1535	114	31x4	Auburn.....6-43	Cont.....	6-3 1/2x4 1/2	23.44	Strom.	Remy.....	s-p B&B.....	Warner.	m Detroit.	1/2 F Col.....	4.60	
	1725		1985d		2045f	2345	122	32x4 1/2	Auburn.....6-63	Weid.....	6-3 1/2x5	25.35	Strom.	Remy.....	s-p B&B.....	Warner.	m Thieme.	1/2 F Col.....	4.60
	1395		1495d		1850		118	32x4	Barley.....	Cont.....	6-3 1/2x4 1/2	23.44	Strom.	Delco.	s-p B&B.....	Fuller.	f M&E.....	1/2 F Col.....	5.10
				2225p															
865	885	725g		1175	1395	109	31x4	Buick.....1923-34-5-6-7-38	Own.....	4-3 1/2x4 1/2	18.23	Marvel.	Delco.	Delco.	m-d Own.	Own.....	m Own.....	1/2 F Own.	4.66
				1325															
1175	1195	975g		1935	1985	118	32x4	Buick.....1923-41-4-5-47	Own.....	6-3 1/2x4 1/2	27.31	Marvel.	Delco.	Delco.	m-d Own.	Own.....	m Own.....	F Own.	4.10
		1435	1625a	1895	2105	124	33x4 1/2	"Buick 1923 48-9-50-4-55	Own.....	6-3 1/2x4 1/2	27.31	Marvel.	Delco.	Delco.	m-d Own.	Own.....	m Own.....	F Own.	4.70
			1675c																
2885	2885	2885		3675c	3950	132	33x5	Cadillac.....61	Own.....	8-3 1/2x5 1/2	31.25	Own.....	Delco.	Delco.	m-d Own.	Own.....	m Spicer.	F Tim.....	Opt.
				3750	3990														
1750	1790		2230d	2480	2575	122	32x4 1/2	Case.....X	Cont.....	6-3 1/2x4 1/2	27.34	Rayfield.	Delco.	Delco.	m-d Own.	Own.....	f Sneed.	1/2 F Col.....	4.66
			1990	2480	2975	129	34x4 1/2	Case.....W	Cont.....	6-3 1/2x5 1/2	31.54	Rayfield.	Delco.	Delco.	m-d Own.	Own.....	f Arvac.	1/2 F Col.....	4.45
1185	1185		1445c	1595	1585	117	32x4	Chalmers.....1923	Own.....	6-3 1/2x4 1/2	25.35	Strom.	A-L.....	Remy.....	m-d Own.	Own.....	m Hardy.	1/2 F Adams.	5.13
			1345		2095	122	32x4	Chalmers.....1923	Own.....	6-3 1/2x4 1/2	25.35	Strom.	A-L.....	Remy.....	m-d Own.	Own.....	m Hardy.	1/2 F Adams.	5.13
1395	1545	1695c		1695	2295	123	32x4	Chandler.....Six	Own.....	6-3 1/2x5	29.40	Strom.	Bosch.	Bosch.	s-p B&B.....	Own.....	f Own.	F Own.	1.45
				2195	2995														
510	525	425g		680	880	103	30x3 1/2	Chevrolet.....Superior	Own.....	4-3 1/2x4	21.76	Zenith.	Remy.....	Remy.....	e Own.	Own.....	m Own.....	1/2 F Own.	3.77
				850															
580	595			750	920	103	30x3 1/2	Chevrolet.....M	Own.....	4-3 1/2x3 1/2	19.60	Carter.	Remy.....	Remy.....	m-d Own.	Own.....	m Mech.	1/2 F Own.	1.44
				930															
1085	995		1095d	1195	1295	112 1/2	31x4	Cleveland.....42	Own.....	6-3 1/2x4 1/2	22.50	Strom.	Bosch.	Bosch.	s-p B&B.....	Own.....	m Mech.	1/2 F Own.	4.90
			1260d	1495d	1595														
2685	2685	2685		3285	3685	127 1/2	33x5	Cole.....890	North.....	8-3 1/2x4 1/2	39.20	Johnson.	Delco.	Delco.	m-d North.	North.....	m Spicer.	F Col.....	4.70
				1925c	1995	115	32x4	Columbia.....Big Six	Cont.....	6-3 1/2x4 1/2	27.34	Strom.	A-L.....	A-K.....	s-p B&B.....	Durston.	m Spicer.	1/2 F Tim.....	4.75
985c			1395d	1295	115	31x4		Columbia.....Light Six	Cont.....	6-3 1/2x4 1/2	23.44	Strom.	A-L.....	A-L.....	s-p B&B.....	Durston.	m Spicer.	1/2 F Tim.....	5.10
			1095	1685															
1195	1235		1495b	1875f	2055	116	32x4	Courier.....	Falls.....	6-3 1/2x4 1/2	23.44	Strom.	West.....	A-K.....	s-p B&B.....	Muncie.	f Flexite.	1/2 F Col.....	5.00
			1565c	2055															
	3100	3100		4500		138	33x4 1/2	Crawford.....23-6-70	Cont.....	6-3 1/2x5 1/2	31.54	Zenith.	West.....	Bosch.	m-d B-L.....	B-L.....	m Spicer.	1/2 F Tim.....	
			3500c	4500		138	33x5	Crawford-Dagmar.....6-70	Cont.....	6-3 1/2x5 1/2	31.54	Zenith.	West.....	Bosch.	m-d B-L.....	B-L.....	m Spicer.	1/2 F Tim.....	
5800	6300			7650		142	33x5	Cunningham.....V4	Own.....	8-3 1/2x5	45.00	Strom.	Delco.	Delco.	m-d Own.	Own.....	f Sneed.	F Tim.....	4.23
4350	4350c	4350	4350c	5300	6000	132	33x5	Daniels.....23-38	Own.....	8-3 1/2x5 1/2	39.20	Strom.	Delco.	Delco.	m-d Own.	Own.....	m Spicer.	F Tim.....	4.23
				6250f	6900f														
1295	1295		1495c	1595	1795	115	31x4	Davis.....71	Cont.....	6-3 1/2x4 1/2	23.44	Strom.	Delco.	Delco.	s-p B&B.....	Warner.	m M&E.	1/2 F Tim.....	5.10
1595	1595		1695d	2095		120	32x4 1/2	Davis.....63	Cont.....	6-3 1/2x4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.....	Warner.	m Peters.	1/2 F Tim.....	5.15
850	880			980	1440	114	32x4	Dodge Brothers.....	Own.....	4-3 1/2x4 1/2	24.03	Stewart.	N.E.....	N.E.....	m-d Own.	Own.....	m Own.	1/2 F Own.	4.10
				1195															
	3950	3950	4150c	4985c	6800	4310	32x5	Dorris.....6-80	Own.....	6-4 x5	38.40	Strom.	West.....	Bosch.	m-d Own.	Warner.	m Spicer.	1/2 F Tim.....	4.23
870	885		995c	1240	1350	108	31x4	Dorris.....23-18	Lyc.....	4-3 1/2x5	19.60	Carter.	Bosch.	Donn.	m-d Detlafl.	Own.....	m Mech.	1/2 F Flint.	4.66
1010	1025		1135c	1355	1465	115	31x4	Dort.....25-20	Falls.....	6-3 1/2x4 1/2	23.44	Carter.	Bosch.	Bosch.	m-d Detlafl.	Own.....	m Mech.	1/2 F Flint.	4.66
5750	5500	5900	5750c	7250	7500	134	33x5	Duesenberg.....Straight 8	Own.....	8-2 1/2x5	26.45	Strom.	Delco.	Delco.	s-p Own.	Own.....	f Climax.	1/2 F Own.	4.45
890	890		1065d	1365	1465	109	31x4	Durant.....A-22	Cont.....	4-3 1/2x4 1/2	24.03	Till.	A-L.....	A-L.....	s-p Own.	Warner.	m Spicer.	1/2 F Adams.	4.33
				1465															
1600	1650		2250	2400		123 1/2	32x4 1/2	Durant.....B-22	Anst.....	6-3 1/2x4 1/2	25.35	Rayfield.	A-L.....	A-L.....	s-p Ansted.	Warner.	m Spicer.	1/2 F Tim.....	5.15
1485	1095		1275d	1395c	1595	112	32x4	Earl.....40	Own.....	4-3 1/2x5 1/2	18.91	Scot.	A-L.....	A-L.....	s-p B&B.....	Own.....	f Own.	1/2 F Own.	4.87
	965		1095	1425		112	31x4	Elcar.....4-40	Lyc.....	4-3 1/2x5	21.03	Strom.	Delco.	Delco.	s-p B&B.....	Warner.	m Peters.	1/2 F Salis.	4.50
1395	1395		1595d	1975f	1995	118	32x4	Elcar.....6-60	Cont.....	6-3 1/2x4 1/2	27.34	Strom.	Delco.	Delco.	m-d Warner.	Warner.	m Spicer.	1/2 F Salis.	4.50
	1045		1145	1145		108 1/2	32x4	Essex.....	Own.....	4-3 1/2x5	18.23	Own.	Bosch.	Bosch.	m-d Own.	Own.....	m Spicer.	1/2 F Own.	4.66
1195			1195	1895c	1985	120	32x4 1/2	Flint.....	Cont.....	6-3 1/2x5	27.34	Strom.	A-L.....	A-L.....	s-p Own.	Warner.	m Spicer.	1/2 F Adams.	4.66
269f	298f	235g		530	595	100	30x3 1/2	Ford.....T	Own.....	4-3 1/2x4	22.50	Own.	Own.	Own.	m-d Own.	Own.....	m Own.	1/2 F Own.	3.63
				725															
3900	3900		4900	4900		132	32x4 1/2	Fox.....7F	Own.....	6-3 1/2x5	27.34	Zen th.	West.....	Scintilla	m-d B-L.....	B-L.....	m Spicer.	1/2 F Tim.....	4.90
	1950		2750c	2250	\$3150d	115	32x4	Franklin.....10	Own.....	6-3 1/2x4	25.35	Own.	A-K.....	A-K.....	s-p B&B.....	Own.....	m Spicer.	1/2 F Own.	4.73
			2850f	2850															
995	995		1145c	1145	1445	112	32x4	Gardner.....Series 5	Lyc.....	4-3 1/2x4	21.76	Zenith.	West.....	West.....	s-p B&B.....	Mech.....	m Peters.	1/2 F Flint.	4.80
490	520			715	785	100	30x3 1/2	Gray.....	Own.....	4-3 1/2x4	21.03	Scot.	West.....	West.....	s-p Own.	Own.....	m Mech.	1/2 F Tim.....	3.90
				835															
2250	2250		2850f	2600		120	32x4 1/2	H.C.S.....Series 4	Weid.....	4-3 1/2x5 1/2	22.50	Strom.	Delco.	Delco.	m-d B-L.....	B-L.....	m Spicer.	1/2 F Own.	4.65
	2650					1													

CADILLAC

V - TYPE , EIGHT - CYLINDER ENGINE

The Cadillac Dealer's most substantial asset is the loyalty of the Cadillac clientele. To these veteran owners the great majority of his sales are made. Their allegiance alone makes his business an established and stable thing.

CADILLAC MOTOR CAR COMPANY, DETROIT, MICHIGAN
Division of General Motors Corporation

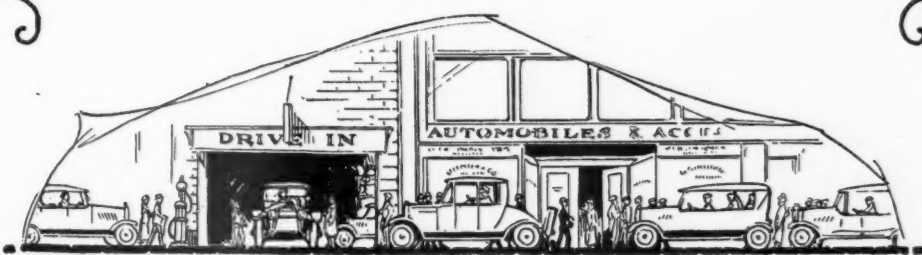


S T A N D A R D O F T H E W O R L D

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES							Wheel Base (Ins.)	Tire Size (Ins.)†	NAME AND MODEL	ENGINE				ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE	
OPEN MODELS			CLOSED MODELS							Make	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make				Type and Make	Type and Make	Gear Ratio
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.														
\$2385	\$1885	\$2385	\$2385c	.....	(3375 2975)	(3075 13375)	124	32x4½	Kissel.....45	Own..	6-3½x5½	26.38	Strom..	Remy..	Remy..	m-d Warner.	Warner..	m Spicer....	F Own..3.92
3985	4090	4090	.....	2145d	2345	5500	132	33x5	LaFayette.....	Own..	8-3½x5½	33.80	Johnson.	Delco.	Delco.	m-d Own....	Own.....	m Own.....	F Own..4.58
1795	1795	1795	.....	(2095	(2345	2345	123	32x4½	Lexington.....23	Anst..	6-3½x4½	25.35	Rayfield.	G-D..	Conn..	m-d Own....	Warner..	f Snead....	F Own..5.10
1575	1395	.....	1575	(1695	2085	2245	117	32x4	Liberty.....10-D	Own..	6-3½x5	23.44	Strom..	Wagner	Wagner	s-p B&B..	Detroit..	m Spicer....	½F Tim...4.80
3800	3800c	3800	.....	4600c	4400	4900	136	33x5	Lincoln.....	Own..	8-3½x5	36.45	Strom..	Delco.	Delco.	m-d Own....	Own.....	m Spicer....	F Tim...4.58
8690	9500c	9600	.....	(1700	(11750	(5100	142	35x5	Locomotive.....Series 8	Own..	6-4½x5½	48.60	Ball&B..	West..	Delco.	m-d Own....	Own.....	m Own....	F Own..3.85
3385	(3185	(3185	.....	4685†	4685†	4385	136	32x4½	Marmon.....34	Own..	6-3½x5½	33.75	Strom..	Delco.	Delco.	m-d Own....	Own.....	m Spicer....	¾F Own..4.10
885	885	.....	(975b	985	1235	1625d	109	31x4	Maxwell.....	Own..	4-3½x4½	21.03	Stewart.	Remy..	Remy..	c Own....	Own.....	f Own.....	½F Own..4.60
5400	4550g	5700	5000c	6720	6690c	(6810	140	33x5	McFarlan.....1923	Own..	6-4½x6	48.60	Rayfield.	West..	West..	m-d M&E..	B-L.....	m Peters....	F Tim...3.75	
3950b	.....	3950c	3950c	.....	4850	6250	132	32x4½	Merced.....Series 5	Own..	4-3½x6½	22.50	Ball&B..	West..	Eisem..	m-d Own....	Own.....	m Spicer....	F Own..3.87
1695	3750c	3750c	3750c	4700	.....	5000	132	32x4½	Merced.....6	Own..	6-3½x5	33.75	Strom..	West..	Eisem..	m-d Own....	Own.....	m Spicer....	¾F Own..3.77
1590	1590	.....	1850c	2050c	2275	.....	119	32x4	Merit.....	Cont..	6-3½x4½	27.34	Strom..	Delco.	Delco.	s-p B&B..	Muncie..	f Snead....	F Col...4.60
.....	.....	.....	1495d	1585c	1605	.....	120	32x4	Mitchell.....F-50	Own..	6-3½x5	29.40	Strom..	Remy..	Remy..	s-p B&B..	Own.....	m Own....	F Own..4.42
.....	1295	.....	1895p	.....	2185	.....	115	31x4	Mitchell.....F-50	Cont..	6-3½x4½	23.44	Strom..	Delco.	Delco.	s-p B&B..	Warner..	m Spicer....	½F Tim...5.10
.....	1785	.....	1995f	.....	2585	2185	128	32x4½	Moon.....6-58	Cont..	6-3½x4½	27.34	Strom..	Delco.	Delco.	s-p B&B..	B-L.....	m Spicer....	½F Tim...5.09
1240	1340	.....	1645c	.....	2090	.....	121	33x4	Moon.....6-57	Own..	6-3½x5	25.35	Marvel..	Delco.	Delco.	s-p B&B..	Own.....	m Own....	½F Own..4.50
915	935	.....	1195d	.....	1890	2190	127	34x4½	Nash.....691-3-6-7	Own..	6-3½x5	25.35	Marvel..	Delco.	Delco.	s-p B&B..	Own.....	m Own....	½F Own..4.50
2475	2475c	3150	2185d	.....	1275	3285	130	32x4½	Nash.....692-4-5	Own..	4-3½x5	18.23	Marvel..	Delco.	Delco.	s-p B&B..	Own.....	m Own....	½F Own..4.88
2500	2500c	3150	.....	3500	.....	.....	128	33x5	National.....BB	Own..	6-3½x5½	29.40	Rayfield.	West..	Delco.	s-p B&B..	B-L.....	m Universal.	F Col...4.08
975	995	795g	1115c	1185	1515	.....	115	32x4	Noma.....4C	Cont..	6-3½x4½	27.34	Zenith.	Delco.	Delco.	s-p B&B..	Detroit..	m Spicer....	½F Tim...4.45
975	975	.....	1145a	1445	.....	.....	115	32x4	Oakland.....6-44	Own..	6-2½x4½	18.99	Marvel..	Remy..	Remy..	c Own....	Muncie..	m Mech....	½F Own..4.66
1825p	1375	.....	1675c	1875	2025	.....	122	33x4½	Oldsmobile.....43 A	Own..	4-3½x5½	21.86	Zenith.	Delco.	Delco.	s-p B&B..	Muncie..	m Own....	¾F Own..4.70
525	525	.....	425g	795	860	.....	100	30x3½	Oldsmobile.....46	Own..	8-27½x4½	26.45	Ball&B..	Delco.	Delco.	c Own....	Muncie..	m Spicer....	F Own..4.93
2485	2185	2250g	2650c	3175c	3275	3350d	106	30x3½	Oldsmobile.....47	Own..	8-27½x4½	26.45	Johnson.	Delco.	Delco.	s-p B&B..	Muncie..	m Own....	½F Own..4.50	
.....	2350c	2685	.....	3525	.....	.....	133	33x4½	Overland.....91	Own..	4-3½x4	19.60	Till.....	A-L..	A-L..	s-p B&B..	Own.....	m Own....	½F Own..4.30
3850	3850	3850	.....	5240	5275	.....	136	35x5	Overland.....126	Own..	6-3½x5	27.34	Own.....	A-K..	Delco.	m-d Own....	Own.....	m Spicer....	½F Own..4.66
2695	2450	2450	.....	3235	3235	3435g	131	33x4½	Packard.....133	Own..	6-3½x5	27.34	Own.....	A-K..	Delco.	m-d Own....	Own.....	m Spicer....	½F Own..4.66
1550	1390	1425	1165d	2395d	2395	.....	120	32x4½	Packard.....335	Own..	12-3x 5	43.20	Own.....	Bijur..	Delco.	m-d Own....	Own.....	m Spicer....	½F Own..4.36
3300	2990	2990	.....	3300	3400	4090	128	33x5	Paige.....6-70	Cont..	6-3½x5	33.75	Rayfield.	Remy..	A-K..	m-d Long..	Warner..	m Mech....	½F Tim...4.60
5250	5250	5250	.....	6800	6900	6800	138	33x5	Paterson.....23-6-52	Cont..	6-3½x4½	27.34	Strom..	Delco.	Delco.	s-p B&B..	Durston..	m Hartford.	½F Salis..4.50
.....	1695	1745	1745	2445	2495	.....	126	32x4½	Peerless.....23	Own..	8-3½x5	33.80	Ball&B..	Delco.	Delco.	m-d Own....	Own.....	m Spicer....	½F Tim...4.90
3150	3100	3250	3300c	4300	5000	5100	126 ½	32x4½	Pierce-Arrow.....	Own..	6-4 x 5½	38.40	Own.....	Delco.	Delco.	m-d Own....	Own.....	m Spicer....	½F Own..4.29	
1095	1095	.....	2585d	3350	3550	3675	128	32x4½	Pilot.....6-50	H-S..	6-3½x5	25.35	Till.....	Bijur..	Conn..	s-p Hoosier.	Muncie..	m Hartford.	¾F Col...4.33
2485	.....	2485	2585d	3350	3550	3675	128	32x4½	Premier.....6-D	Own..	6-3½x5½	27.34	Johnson.	Delco.	Delco.	s-p B&B..	Own.....	m Spicer....	½F Own..4.58
.....	1665	2385c	2175	.....	3550	132	32x4½	Premocor.....6-40-A	Falls.	6-3½x4½	23.44	Strom..	Wagner	Wagner	s-p B&B..	Mech....	m Spicer....	½F Own..5.09	
2850	2900	2850c	.....	3500	3700	124	32x4½	Princeton.....	Anst..	6-3½x5½	27.34	Rayfield.	A-L..	A-L..	m-d Own....	Own.....	m Spicer....	½F Own..5.12	
1615	1485	1745	1855c	2136d	.....	.....	120	32x4	Princeton.....	Anst..	6-3½x5½	27.34	Rayfield.	A-L..	A-L..	m-d Own....	Own.....	m Spicer....	½F Own..5.12
.....	1485	1855c	1985d	.....	3585	3585d	117	32x4	R & V Knight.....R	Own..	4-3½x5	22.50	Strom..	Wag..	Wag..	s-p B&B..	B-L.....	m Spicer....	½F Salis..4.73
2685	2485	2685	2750c	3285	3585	3585d	128	32x4½	R & V Knight.....H	Own..	6-3½x4½	29.40	Strom..	A-L..	A-L..	s-p B-L..	B-L.....	m Spicer....	½F Tim...5.40	
.....	3685	3485	3800	3650c	4250p	3950	138	32x4½	Reo.....T6	Own..	6-3½x5	24.34	Rayfield.	N.E..	N.E..	m-d Own....	Own.....	m f Own....	½F Own..4.70	
3785	.....	.....	.....	.....	3950	.....	128	32x4½	Rickenbacker.....B	Own..	6-3½x4½	23.44	Strom..	Bosch.	Bosch.	s-p Own....	Warner..	m Mechanics.	¾F Col...4.63
10900	10900	10950	.....	12800	12800	.....	143 ½	33x5	Roamer.....6-54-E	Cont..	6-3½x5½	29.40	Strom..	West..	Split..	s-p B&B..	G-L.....	f Snead....	½F Tim...4.60
.....	1645	1645	.....	2615d	2615	.....	118	33x4	Roamer.....4-75-E	Cont..	4-4½x6	28.90	Strom..	West..	Split..	s-p B&B..	G-L.....	f Snead....	½F Tim...4.60
875	875	.....	.....	3300	3400	3500	127	34x4½	Rolls-Royce.....40-50	Own..	6-4½x4½	48.60	Own.....	Bijur..	Bosch.	c Own....	Own.....	m Own....	F Own..4.25
985	985	.....	.....	3300	3400	3500	127	34x4½	Rubay.....	Own..	4-2½x5½	12.10	Strom..	Bosch.	Bosch.	s-p Own....	Own.....	m Universal.	F Own..3.10
.....	2750	2750	2425c	.....	3585	3985	130	32x4½	Sayers Six.....DP	Cont..	6-3½x4½	27.34	Strom..	Delco.	Delco.	s-p B&B..	G-J.....	m Arvac....	½F Eaton..4.75
319r	348r	285g	580	615	.....	.....	102	30x3½	Seneca.....I-2 & O-2	Lye..	4-3½x5	19.60	Zenith.	A-L..	A-L..	s-p B&B..	G-L.....	m Universal.	F Peru...4.75
2250	2250	2150	2775c	3150	3450	.....	125	34x4½	Seneca.....50c & 51c	Lye..	4-3½x5	21.03	Zenith.	A-L..	A-L..	s-p B&B..	G-L.....	m Universal.	F Peru...4.90
2700	2700	2850	2700c	3350c	3500	4500g	130	34x4½	Standard.....99	Own..	8-3½x5	33.80	Zenith.	West..	Split..	s-p B&B..	G-L.....	m Arvac....	½F Tim...4.45	
1345	1295	1985c	1595d	1895	.....	.....	117	32x4	Stanley.....740	Own..	2-4 x 5	None	.....	Bijur..	None..	None....	None....	None....	½F Own..1.50
975	975	785g	.....	3150	3450	.....	125	34x4½	Star.....	Cont..	4-3½x4½	15.63	Till.....	A-L..	A-L..	s-p Own....	Warner..	m Spicer....	½F Tim...4.87
1250	1275	.....	1000c	1875c	2050	.....	119	32x4	Stearns-Knight.....SKL4	Own..	4-3½x5½	22.50	Rayfield.	West..	A-K..	m-d Own....	Own.....	f Climax..	½F Own..4.50
1450r	1750	1835d	1975d	2550	2750	.....	126	33x4½	Stearns-Knight.....6	Own..	6-3½x5	27.34	Rayfield.	West..	A-K..	m-d Own....	Own.....	f Climax..	½F Own..4.70
1995	1995	2640	2755c	3115c	.....	.....	130	32x4½	Stephens.....10	Own..	6-3½x4½	25.35	Strom..	Delco.	Delco.	s-p B&B..	Mech....	m Mech....	½F Tim...4.66
2150	2790	.....	1855c	2085c	22														



Is It Worth While To Pleas Your Customers?

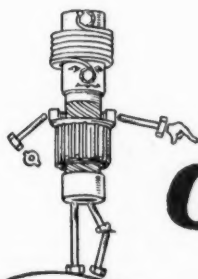
THE CUSTOMER who has poor service from an inferior replacement part, is soon gone. When he loses confidence in the thing he buys, he loses confidence in the man who sells it. And mighty soon he is no longer a customer!

But a *pleased* customer is any dealer's greatest asset. *Genuine* parts please your customers because they give complete satisfaction.

Is it any wonder that far-seeing dealers and garagemen *prefer* to sell *genuine* parts? They take no chances in a matter so closely related to the very foundation of a profitable business.

In our experience, none but a genuine part will give our standard of satisfactory, dependable service in The Bendix Drive.

CAUTION: In our Bendix Drive advertisements, now appearing regularly each month in The Saturday Evening Post and The Literary Digest, the public is being cautioned to buy none but *genuine* service parts.

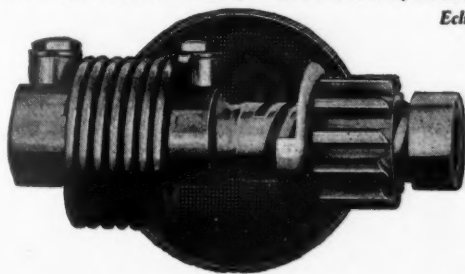


It pays to sell none but
GENUINE PARTS
FOR
BENDIX
DRIVE

ECLIPSE MACHINE CO., ELMIRA, NEW YORK

Detroit Office:
1342 Book Bldg.

Eclipse Machine Co., Limited
Walkerville, Ontario





"The best things in business today are old-fashioned honesty and old-fashioned standards of quality hooked up to modern efficiency."

The secret of Russell, Burdsall & Ward's dominance in the bolt and nut field is found in the simple quotation above.

RUSSELL, BURDSALL & WARD
BOLT & NUT COMPANY

PORT CHESTER, N.Y.

PEMBERTON, CONN. • CHICAGO • SAN FRANCISCO • ROCK FALLS, ILL.

Makers of Bolts, Nuts and Rivets Since 1845

EMPIRE BOLTS

Who Are These Jobbers?

JOBBERS whose salesmen go into a dealer's place with eager enthusiasm, and come out with a hearty "Call again, soon" ringing in their ears—and a fat order booked.

Jobbers who have earned the faith and good will of every dealer in their territories by presenting goods that sell easily and repeat quickly, paying rich profits.

Jobbers with faith in advertising which makes them take full advantage of every bit of help given them.

Jobbers in the habit of earning cash discounts—and seeing that dealers earn theirs.

These are the jobbers to handle the Yale Oiling System for Fords, because the Yale System, and the sales policy behind it fit exactly into the business of such jobbers, and pay them superlatively well.

We'll send full particulars.



Roland & Koch
411 S. Main St., Los Angeles, Cal.
2715 N. Broad St., Philadelphia, Pa.

YALE **OILING**
SYSTEM
for FORDS

How to Get a Profitable Spark Plug Business

Here Are a Few Suggestions on How and When to Sell Sets

When overhauling a motor—
When doing minor repair jobs—
When putting in oil, examine the plugs.
When a customer calls for one plug or a porcelain—
When you find motors fitted with odd assortments of plugs—
When you find a motor with the wrong size or type of plugs.

When a motorist asks for a plug do not just place a single plug in front of him but put down a full set together with an *AC Plug Kit* and point out that probably what he needs is a new plug in each cylinder to be assured of a better running motor.

Show him how convenient it is when the motor misses or performs poorly to take the *AC Plug Kit* and change the plugs, instead of losing time to locate the missing cylinder. Then at his convenience he can clean and test the removed plugs and put them back into the *AC Plug Kit* ready for future use.

Here Are a Few Reasons Why AC's Are the Plugs You Should Sell

The fact that most builders of fine cars use AC's for factory equipment year after year is outstanding proof of AC quality. Furthermore, it means that there are very large numbers of car owners in your community who know that AC's are the proper plugs to use. This alone creates a tremendous market.

This quality has built up AC's great list of original equipment cars and preserves this business throughout the years.

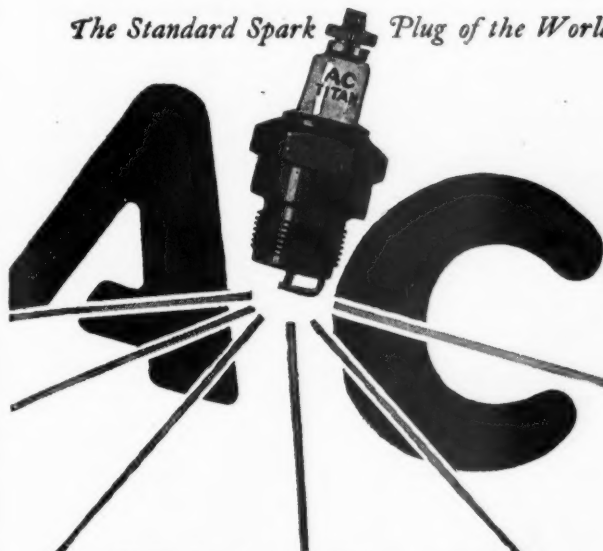
The public has learned the quality of AC's through using them and through AC's strong advertising.

For these reasons AC plugs are more easily sold to all car owners, whether their cars were originally equipped or not.

So, you see, it is to your best interest to handle AC plugs exclusively. Then you do not have money tied up in several lines, and your turnover is greatly increased.

S e l l A C S p a r k

The Standard Spark Plug of the World



This Is How the AC Market— Lines Up in Your Community

Think of all the Chevrolets—they have always been AC-equipped

- all the Buicks*—AC-equipped for fourteen years
- all the Dodge Brothers*—have never used anything but AC
- all the Nash cars*—always AC-equipped
- Oaklands*—for the past fourteen years AC-equipped
- all the Overlands*—AC-equipped for years
- and all the other cars: Apperson, Cadillac, Case, Chalmers, Chandler, Cole, Dort, Essex, Haynes, Hudson, Hupmobile, Jewett, Jordan, LaFayette, Marmon, Maxwell, Oldsmobile, Paige, R & V Knight, Star, Willys-Knight, and more than two hundred others*
- all AC-equipped and already in use in your locality!

This tremendous ready-made market for AC's is right at your door and will always be there in ever-increasing size.

Chevrolet is making about 2,000 cars a day
Buick is turning out over 700 a day
Dodge Brothers are making over 700 cars a day ...
Durant and *Star* over 500 cars a day
Overland and *Willys-Knight* close to 400 a day ...

**All AC
Equipped**

Then add all the others and just visualize the enormous production, every day, of cars factory-equipped with AC plugs. Each day, the demand for AC's grows bigger.

For fifteen years AC's have been making friends until today there are millions of motorists who will have no other plugs and other owners are fast realizing that AC's are the safe plugs to use.

Also, with the AC Carbon Proof now made in all

sizes, you have the most successful plug ever devised for motors that have a tendency to foul spark plugs.

Read on the following page about the AC 1075 *Special for Fords*, which gives you an opportunity to take first place in the enormous Ford plug replacement business.

These facts prove that so far as spark plugs are concerned AC is the logical line upon which you should concentrate.

AC Spark Plug Company, FLINT, Michigan

U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

Plugs by the Set



More than
125,000

Durant and
Star Cars

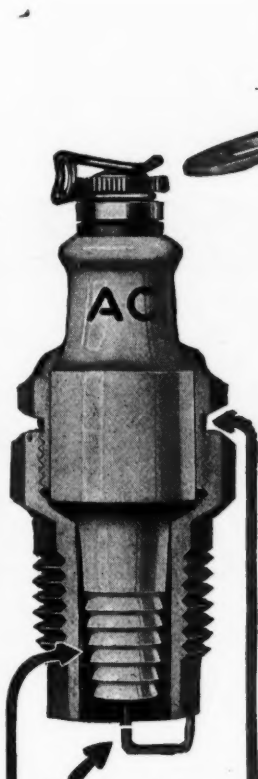
built by Durant Motors,
Inc., have now been pro-
duced and sold.

Durant merchandisers who have profited through the unprecedented success of Durant Motors consider their Durant and Star selling franchises the most valuable they have ever had. An opportunity is offered automobile merchandisers of the highest type to become a part of a select, successful and growing organization of Durant merchandisers. Write to

DURANT MOTORS, Inc.

Long Island City, N. Y.

The Market for AC 1075 is the Largest in Your Community



New electrode design forms a natural drain so that no oil can lodge in the spark gap.

Unscrew this bushing and plug comes apart. Notice compact porcelain to withstand hard service.

Patented CARBON PROOF porcelain with its high temperature fins attains sufficient heat to burn oil deposits, thus offering effective resistance to carbon.

AC 1075
Special
for
Fords

The market for AC 1075's is the largest in your community because of the large number of Fords in operation and the chance it gives you to sell complete sets of AC 1075's to replace worn-out and incorrectly designed plugs.

Ford engines, just as much as others, need the best plugs because a good spark in each cylinder is a necessity in any engine.

AC's answer to the need for a better plug for Ford engines—cars, trucks and tractors—is the now famous AC 1075.

No Ford owner is interested in changing brands unless he gets better plugs.

Experience has taught him the faults of all ordinary plugs and he can see at a glance that the AC 1075 is designed and built to correct these shortcomings.

When the Ford driver asks for a plug place the *AC Plug Kit* before him, containing four AC 1075's, and point out to him that probably what he needs is a new plug in each cylinder to be assured of a better running motor. Show him how convenient it is when the motor misses or performs poorly to take the *AC Plug Kit* and change the plugs, instead of losing time to locate the missing cylinder—then at his convenience he can clean and test the removed plugs and put them back into the *AC Plug Kit* for future use.

This *AC Plug Kit* is something every Ford owner has always wanted. You can offer them these free with a set of AC 1075's—the kits cost you nothing—ask your jobber's salesman.

This will enable you to sell in sets of not less than four and to greatly increase your spark plug sales.

Thousands of dealers are fast building a big, profitable spark plug business on AC 1075's. Our advertising is constantly placing it before the Ford owner who is already impressed with AC quality.

AC Spark Plug Company, FLINT, Michigan

U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

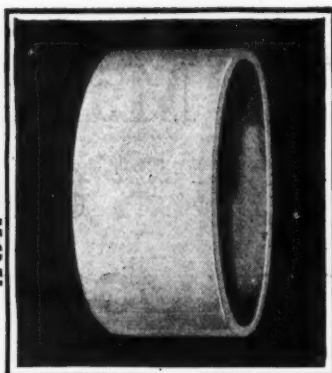


The AC Plug Kit
—to carry spare plugs

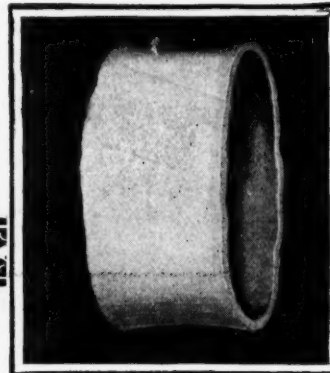
The Standard Spark **AC TITAN** Plug of the World



Section of Hanes Red Inner Tube. Note straight top and base lines. No strain. Tube is made the natural way.



Section of ordinary smooth or "slick side" tube. Notice how tension — due to tube being turned inside out by maker — causes the edges to curl.



**"One is right
— one is wrong!"**

**Are you able to tell which
kind of tube you sell?**

OUT of all those inner tubes on your shelves, can you tell which are made right and which wrong? Can you tell which make will wear longest and which will reach the junk man first? You can if you know how they are made.

this strain causes cracking, first on the edges where the tube is folded up and then elsewhere. That is why tubes "go bad" without ever leaving your shelves. That is why customers kick about your service and make friends with your competitor.

The right way and the wrong

WHEN the tubes are cured, the inner side rests against the smoothly rounded pole. Naturally, it comes forth smooth. The degree of smoothness of the outer side, on the other hand, is dependent upon the care and skill of the maker. Practically every tube maker takes the easiest way out of this difficulty. He turns the tube inside out. This method saves a great amount of time, cuts production costs, and hides poor workmanship.

How the tube is injured

TURNING the tube wrong side out places a small but constant strain upon it. In time

Hanes Red Tubes are different

HANES Red Inner Tubes are made with such skill and care that they do not need to be turned inside out to look good. Hanes Tubes are left in their natural position. They grow better as they grow older. Time does not impair their fine qualities.

Furthermore, every dealer who sells Hanes Cords and Hanes Tubes is supported by a strong local newspaper campaign, under his own name, paid for by the Hanes Rubber Company of Winston-Salem, N. C. If this is the sort of cooperation you are looking for, we shall be glad to tell you more when you write.

HANES RED TUBES

The High Water Mark in Tube-making Skill

**Make your
tire repair
work yield
a better
profit**



Here's the equipment you need—

WEAVER

Tire Spreader

You know how necessary it is to inspect the interior of every casing that comes into your shop for any breaks or other trouble, before putting in a new or repaired tube. With a Weaver Tire Spreader it's an easy job to thoroughly inspect every inch of the casing in a fraction of the time usually required. When the job goes out, you know it's right. And by being able to show your customers the condition of the inside of their casings, you'll sell more vulcanizing jobs and more new tires. Service like this will make new friends for you as well as hold old ones—and make profits grow.

WEAVER
Universal

Tire Changer

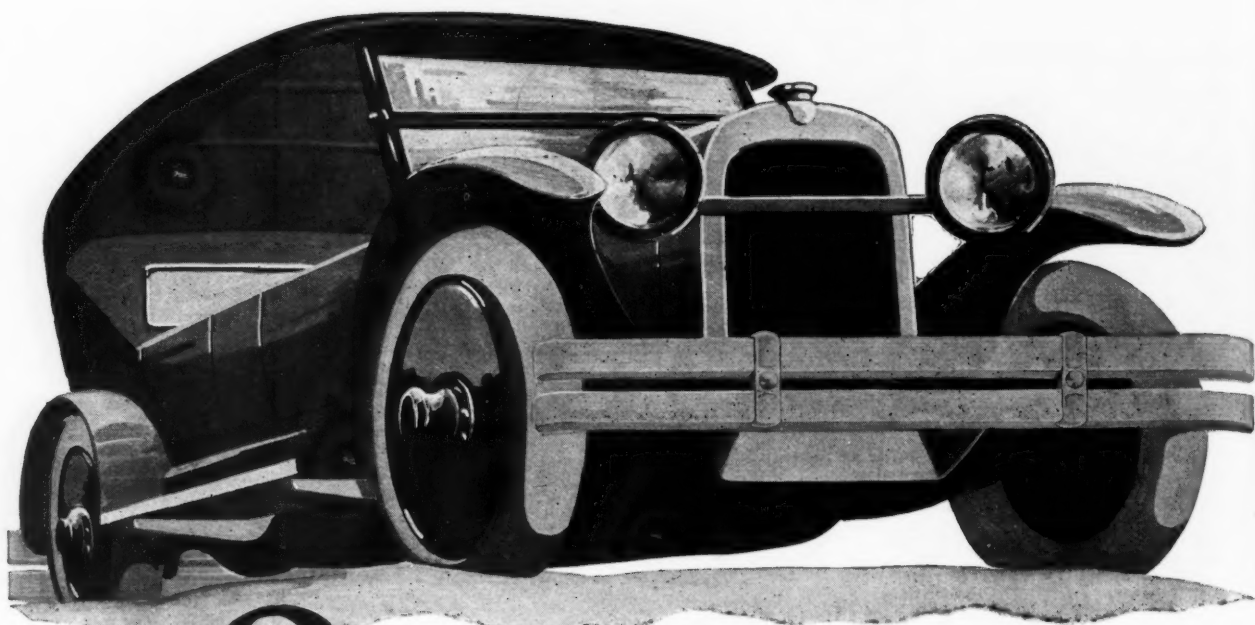
Practically every tire repair job that comes into your shop requires the tire to be removed from the rim. The time the Weaver Universal Tire Changer will save you, especially on the difficult jobs, will soon pay for it. Even more important is the increased patronage it will bring your shop. Car owners will be quick to realize the advantage of having their tires and rims handled on this equipment, quickly and efficiently, without danger of injury. They will drive miles out of their way to get this better service. It's up to you whether they go to your shop or elsewhere.

We'll gladly mail you a copy of our catalog describing our complete line of time and labor savers for the garage. Write today for Catalog

WEAVER MFG. CO., Springfield Illinois, U. S. A.
Weaver Canadian Co. Ltd., Chatham, Ontario



HAYS HICKORY HITTER



Supreme

HERE, at last is a bumper that is supreme in every detail—one that has no equal. Beautiful—individual and massive, yet weighing less than one-half as much as other types. Having the highest rating for protection and carrying the maximum reduction in collision insurance rates with its use, yet selling at an astonishingly low price. And sold with the strongest guarantee possible to offer, one that lasts “for the life of your car.”

The Hays Hickory Hitter has had the iron test of actual usage on cars of all makes in over thirty states, during the last three years; as well as the rigid tests of the Underwriters’ Laboratories.

Every part from the straight grained hickory bars back to the last hook bolt has been brought to perfection. The bumper bars are steam-bent, second growth hickory—tough and resilient as steel though weighing vastly less. The crucible steel springs are scientifically shaped

and tempered and are clamped to the hickory bars with massive brass castings. There are fittings for every make and model of car. Fittings which really fit and without drilling any holes.

We, of the Hays Company, have been making hardwood products for the past forty-five years—such things as saddle trees, stirrups, pack trees, harness maker’s clamps, etc.; where the strength of steel is absolutely necessary but without its overbearing weight. We understand the seasoning, modeling and finishing of wood as well as its advantages better perhaps than any other organization in the country. And it is this forty-five year-old experience as well as an unbeatable guarantee behind the Hays Hickory Hitter which makes it the ultimate bumper.

We make two types of bumpers—double bar and single bar. Both types are made of the same high grade material—with the same expert workmanship and carry the same “for the life of your car” guarantee.

Double bar type **\$18⁰⁰**
Weighs 27 pounds . .

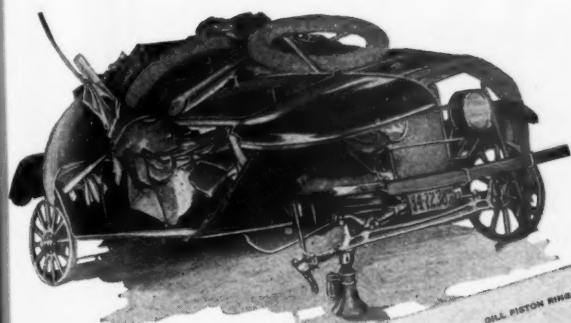
Single bar type **\$12⁵⁰**
Weighs 18 pounds . .

J. M. HAYS WOOD PRODUCTS CO.

Division Standard Crate & Filler Company
JEFFERSON CITY, MO.

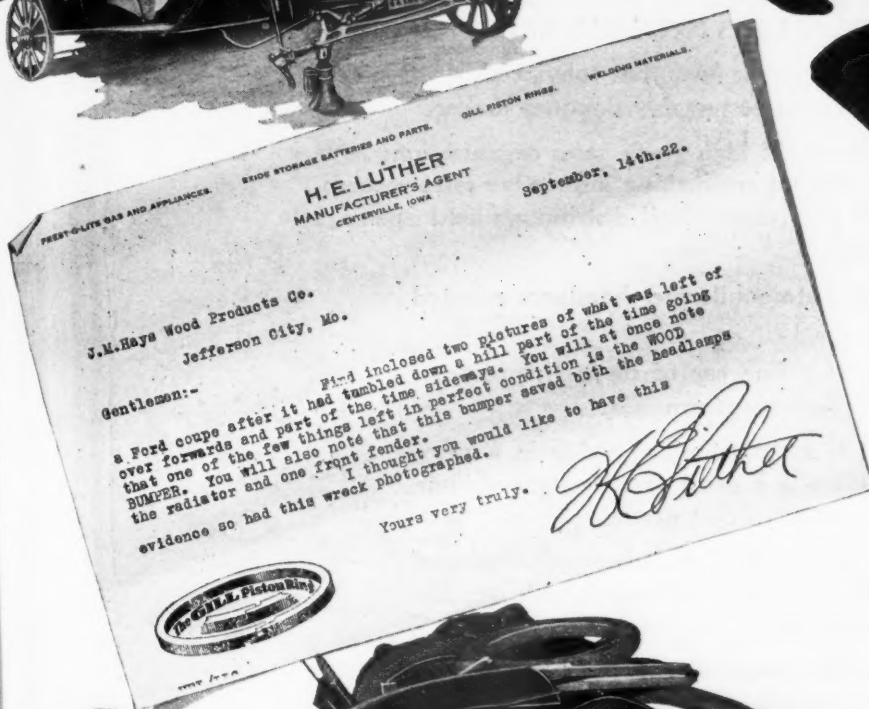
Guaranteed for life of your car

HAYS HICKORY HITTER



Testimony

*such as this is
the reason why!*

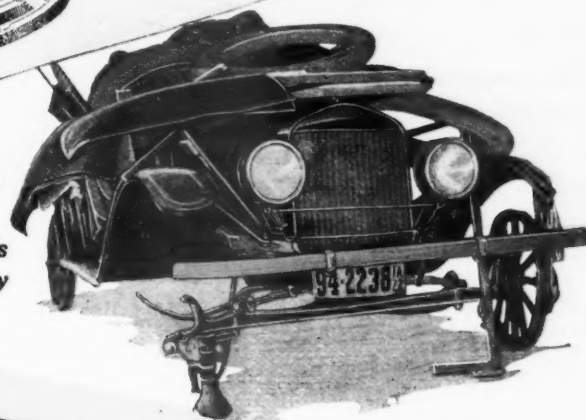


Here is one of the hundreds of letters which come to us from all over the country. They tell of accidents—commonplace accidents and unusual accidents—with large cars and with small cars. But the keynote of them all is—the Hays Hickory Hitter and what an extraordinary bumper it is.

Because of such testimony as this and from exhaustive tests of our own over a period of years—we place behind the Hays Hickory Hitter the strongest guarantee ever placed on an automobile bumper by any reputable manufacturer—that we guarantee it against breakage FOR ANY REASON for the life of your car; and we will replace any broken bumper free of charge.

We do not claim that the Hays Hickory Hitter cannot be broken—anything will break if subjected to a great enough strain, but the hickory bumpers are shock absorbing until the last fibre is torn in two and a truly tremendous shock is necessary to break them because of their nature grown resiliency and strength.

**This
Guarantee Tag is
attached to every
bumper sold**



Dealers There is no bumper made which you can handle with so much satisfaction and profit as the Hays Hickory Hitter. It makes friends for itself and for dealers wherever it goes. One Hays Hickory Hitter on the streets means fifty more sales. Write for catalog and the name of our jobber in your territory, also for our contract plan of sales to dealers.

Jobbers Desirable territory is still open. Write for details

Guaranteed for life of your car

And he broke all Records!

In the first month after John Boe secured the Kissel franchise in St. Louis, HE BROKE ALL HIS PREVIOUS SALES RECORDS.

Read on the opposite page the facts that convinced Mr. Boe that the Kissel franchise was unquestionably a money maker.

Since the Chicago Show, 62 high grade sales organizations have taken on the Kissel, and all are making impressive sales records. During two weeks in May, new Kissel distributors held openings in five important cities.

These keen automobile merchandisers selected the Kissel—

Because it is a fine car of distinctive appearance and impressive performance.

Because it is an outstanding value in a price class where there is a great and constant volume with correspondingly good profits.

Because it is backed by an adequately financed company with 17 years' experience with capable owner-management.

Because of the progressive policies of advertising and dealer co-operation.

The wisdom of their choice is proven by their sales records. Give us an opportunity to show YOU how fine an automobile is built at the Kissel price, and how you can equal the remarkable sales records of others.

KISSEL MOTOR CAR CO.
Hartford, Wisconsin

KISSEL

The Custom



Built Car

SUNDAY, March 18, 1923—196x4.

KISSEL

The Custom  Built Car

"I Have Secured the KISSEL Franchise for St. Louis — and I want to tell you why —"



JOHN BOE,
President
Saint Louis Motor Car Co.

Because careful automobile buyers look for those features and items essential to their ideal car—I have for some time been looking for an automobile as truly custom-built as the very expensive makes—yet within reach of those who can afford a medium-priced car.

After making a personal analysis of the leading cars as to appearance, driving comfort and performance on the streets here in St. Louis, I found the type of car I wanted in the Kissel Custom-built Six—

I have just returned from the Kissel factories at Hartford, Wisconsin, where, in company with E. Lewis of Marion, Ill., a long-time friend and business associate, we made an exhaustive investigation as to manufacturing methods and whether custom-building was really a fact and practice—

We found that the Kissel is distinctively a product of master craftsmen—and while produced on a quantity basis, each car is built as if to a particular customer's order—including all features and details essential to the owner's ideal of a car.

I saw how body fashions were designed by Kissel to create the distinctive and individual appearance of advanced body styles—

I saw how Kissel attained perfect roadability that makes a car as easy to drive and handle at 60 miles as at 20 miles an hour—

I saw how Kissel custom-builds his own chassis so that rattles and squeaks will not develop—

I saw how Kissel completely custom-builds his motor so that it properly powers the particular model for which it is designed—

I saw how Kissel hand-builds completely his solid bodies of individual design and substantial construction—

I saw how Kissel inspection standards and tests insure the use of only the highest grade materials necessary for sterling quality—

I saw how Kissel equips his cars so that the owner's convenience is properly provided for—

In short, I saw how Kissel actually manufactures practically 95% of his car under one roof, where uniformly high standards of workmanship are guaranteed, and how he has increased production to that quantity that permits prices hitherto thought impossible low for a car so made.

To Lewis and myself—this trip was a revelation—for we had found a car and saw how it was built just as we would design it for the critical and experienced motorists of St. Louis—a car we personally could recommend 100% to our dearest friends as the best car they have ever driven—no matter what make they now own.

I want you to see these cars and experience the same thrill I had when I realized what Kissel had accomplished—produced a really custom car in every particular at a price you can well afford—

Let me personally show you this car—inside and out—and then behind the wheel out on the boulevards and country roads.

I'm staking my reputation as a practical automobile man on this Kissel—and you know what that means.

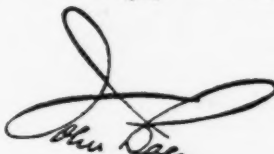
Beginning Saturday, March 24, we will hold our formal Kissel opening, featuring the latest custom-built creations by Kissel, including the new low-priced Model "Fifty-five."

You are cordially invited.
This display will prove of special interest to local Kissel owners whom we specially invite to inspect the new models—our service station and parts depot.

Saint Louis Motor Car Co.
Bomont 1262, Central 7170

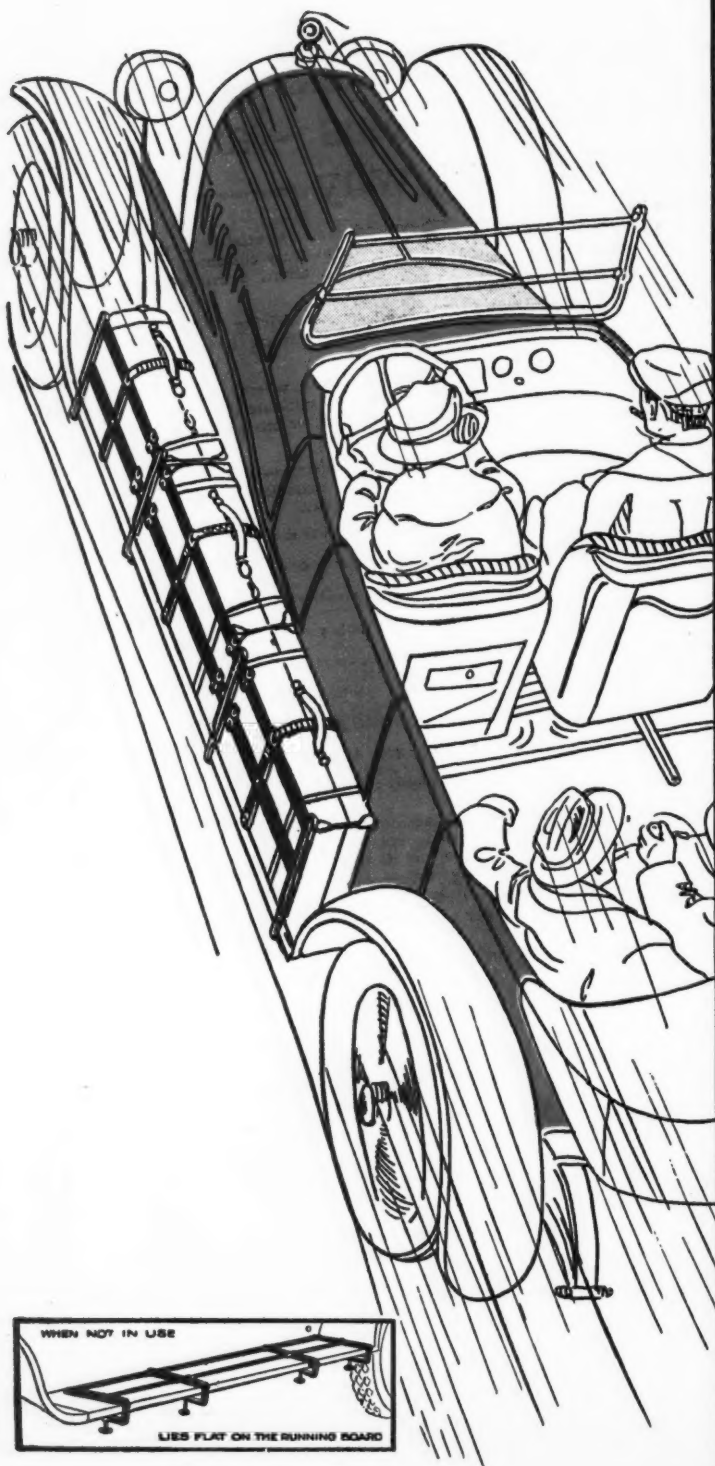
2801 Locust St.,
E. Lewis Motor Sales Co., Marion, Ill.
Distributors for Southern Illinois.

St. Louis, Mo.
Attractive Dealers' Proposition
in Missouri and Illinois


President

MARQUETTE

LUGGAGE CARRIER



FIVE years on the market have proven that the "Marquette" is by far the most popular and satisfactory luggage carrier yet produced.

It has every desirable feature to be found in other carriers, and in addition, has several exclusive features which give it decided advantages in convenience, capacity and protection to the body finish of the car.

Protects Finish of Car. The luggage is strapped to the carrier and held fast—away from the body of the car. 60-inch strong web straps are provided, with ingenious metal plate clamps that hold straps securely to carrier.

Folds down flat—out of the way—when not in use. There's no need of the bother of taking it off and putting it on. Just pull it up off the running board when you want to use it.

Attractive in appearance. Its trim straight lines blend with the body lines of the car—enhancing its looks.

Fits any running board. Made in two sizes—both adjustable in length, 4 feet and 5 feet when extended. It lies flat when folded up and fits nicely under the seat of the car. Quickly attached without tools.

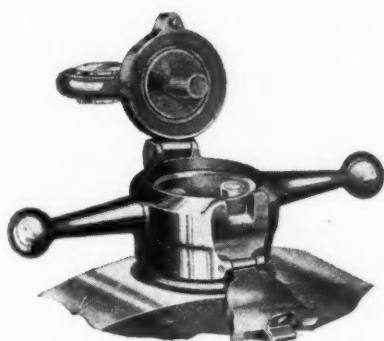
Carefully made of high-grade steel—finished in special black enamel.

It's a **quality** product through and through—strong, durable and neat. You must see it to appreciate the material and workmanship we put into it.

***Sold by Live Jobbers
and Dealers***

MARQUETTE MFG. CO.
St. Paul, Minn.

Dealers: Your jobber has an unusual proposition to make on the Marquette. Ask him.



Price

\$6⁰⁰

West of Rockies \$6.50

Do you realize that you have lost many sales by not having the right size bar cap in stock? Lost sales means lost dollars.

Put in a stock of Triangle Caps and assure yourself of every nickel's worth of cap profit possible.

The Triangle Cap fits nine out of ten cars. No adapters, reducers, etc., are necessary. It fits as it is. Anyone can install it in a few minutes without cutting, filing, etc. No special tools needed.

The Triangle is **bronze built**. Heavy bronze castings are smoothly finished and heavily nickel plated. No chance for rust or corrosion.

With each cap a card is enclosed for use of the purchaser in securing the desired monogram plate from the factory at no additional cost. Monogram plates are instantly and permanently attached without the use of special tools.

Both motor meter and cap are automatically locked against theft. After a Triangle Cap is installed it stays securely in place. It will not turn around.

If Your Jobber Cannot Supply You—Order Direct, We Will

Manufactured by

TRIANGLE MFG. CO.

230 W. Superior Street

Chicago, Ill.

Sales Department

THE ZINKE CO.

1321 Michigan Ave.

Chicago, Ill.

TRIANGLE UNIVERSAL THEFT-PROOF RADIATOR CAP

Bronze  *Built*



KINLOCH 628

FRANKLIN MOTOR CAR CO.

SIMPSON BROS.

Automobiles and Accessories

316-318 WEST WASHINGTON ST

BLOOMINGTON, ILL.

DISTRIBUTORS OF



S. M. C. TRUCKS

CASE TRACTORS

Mch. 16th 1923

Brunner Mfg. Co.
Utica,
N.Y.

Gentlemen:-

Your recent inquiry relative to the service derived from the compressor which we purchased from you six years ago, has been received, and in reply wish to state that we have had no trouble of any kind with the machine even though it has been in constant service for six years seven days in the week.

We cannot recommend this compressor too highly to any one that is contemplating the purchase of an air compressor.

After the installation, you forget all about it, as same requires no attention to speak of, and you can always rely on same to give you the service at all times.

You are at liberty to use this letter in any way to convince prospective buyers, that yours is a superior machine.

Very truly yours,



ADM

1. Quick-Starting
2. Silent-Running
3. Speedy-Filling
4. Low Cost
5. Super-Safe

"Good for 20 Years at Hard Labor"


BRUNNER MFG. CO.

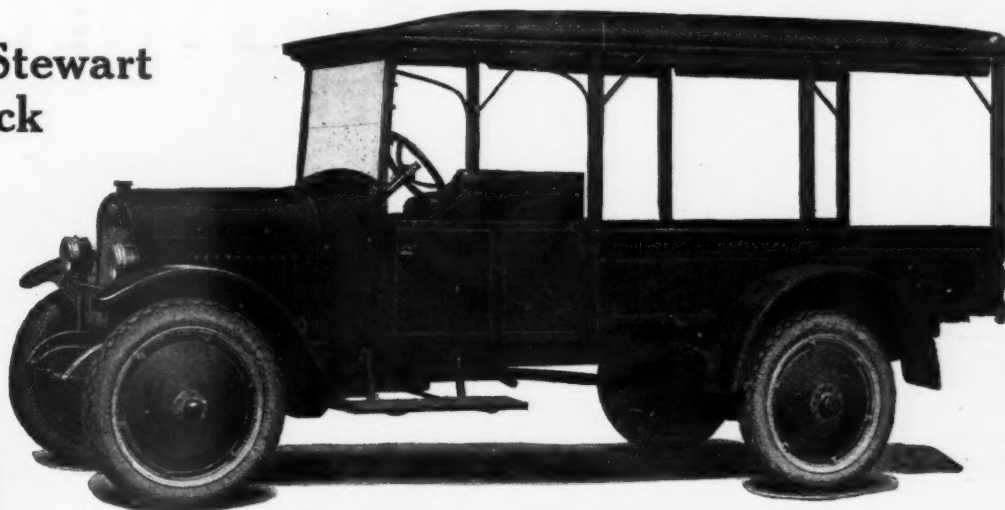
Utica, N. Y.

Oldest and Largest Manufacturers
of Garage Air Compressors in
the world.

Sales Offices: Cincinnati, Kansas
City, San Francisco, and nearly
ALL jobbers.

The New Stewart 1-Ton Truck

Bodies
for
Every
Business



New Stewart 1-Ton Truck, With Body and Complete Equipment as Illustrated, \$1185, F. O. B. Buffalo

"Sold 42 New Stewart 1-Ton Trucks in 3 Days"

Herman Motor Truck Co., New York

Equals Trucks Costing up to \$1800

Read What Stewart Dealers Say About It

Herman Motor Truck Co., New York—sold 42 in three days. Customers who have received deliveries delighted. Never had such an easy selling proposition in my life. Estimate we will move at least 1,000 of them in 1923.

Ruth & Mathews, Brooklyn, N. Y.—How do you do it at the price? It is a wonder. Will set Long Island afire with them.

Stewart Automobile Corp., Boston, Mass.—Our demonstrator has arrived. It's a world-beater—beyond our expectations. It's a self-seller. Wire quick how many you can possibly ship this week.

Stewart Automobile Corp., Worcester, Mass.—Left factory yesterday on drive-away with demonstrator. Arrived home today, 471 miles. Averaged 17 miles to the gallon of gasoline. Stopped three times on the road

by people interested in it. Have six orders already. It will sell like hot-cakes.

Stewart Motor Truck Co., Chicago, Ill.—Received new 1-ton demonstrator five days ago. Have twenty-one orders. Start car-load shipments quickly.

Hinkel Motor Truck Corp., Cleveland, Ohio—The new 1-ton Stewart is a sensation. Received our two demonstrators today. Enter our order for 25 more to be shipped as soon as possible.

W. F. Funk, Ashtabula, Ohio—arrived home with my demonstrator. Averaged 16 miles per gallon. Delivered demonstrator to customer this afternoon. How soon can I get more?

Gomery-Swartz Motor Car Co., Phila., Pa.—New 1-ton making a great hit. Owners highly pleased. Mailing 26 orders tonight.

Liberal Discounts to Dealers in Small Towns

Backed by 10 Years of Successful Truck Manufacture and Financial Stability

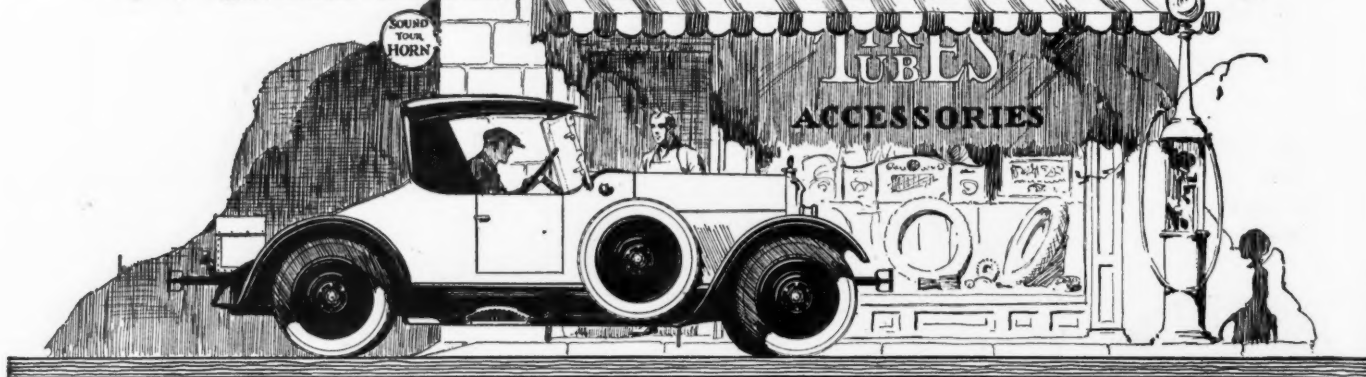
Write or
Wire Today

STEWART
MOTOR CORPORATION Buffalo N.Y.

Other Sizes
f. o. b. Buffalo

1¼ to 1½ ton	\$1495
1½ to 2 ton	1870
2½ to 3 ton	2590
3½ to 4 ton	3440

Which is Better?



This or This

A motorist drives up to your shop to have the contact points of his igniter renewed.

Knowing that his car is Connecticut equipped, and believing that clean business and prompt service always pay best, you raise his motor hood, disconnect the primary lead, remove the distributor cap, lift off the distributor arm, unscrew the breaker mechanism, and replace it (simply by reversing the above procedure) with one of our genuine factory built, factory tested and factory guaranteed breaker mechanism units.

Without depriving your customer of the use of his car, you have licked his trouble most effectually.

In less than five minutes, and with no tool other than a screwdriver, you have made the most dependable repair possible.

You have made a fair profit on the work and you have sent your customer on his way happy and contented.

A motorist drives up to another man's shop on the same errand.

For some reason or other, this chap thinks our policy of furnishing genuine Connecticut contact points only in a complete breaker assembly is unjust.

So, instead of handling the job as you did, after disassembling the igniter, he goes to his stock of pirate parts, picks out a breaker arm, and a point, and sets out, without the right tools, without the necessary jigs, without the proper testing apparatus, to do a job he is neither competent to undertake nor equipped to handle.

With the result that he not only deprives his customer of the use of his car for two or three hours, but hands him a bill anywhere from 50 cents to \$1.50 more than the price of a genuine breaker plate assembly.

And, instead of relieving his customer's trouble, he has only made it worse—as you can see at a glance by comparing the two pictures below.



Genuine Connecticut Breaker Plate. Note perfect contact and fine alignment of points.



Pirate arm made to work with Connecticut Breaker Mechanism. Note lack of alignment and judge for yourself the service it will give.

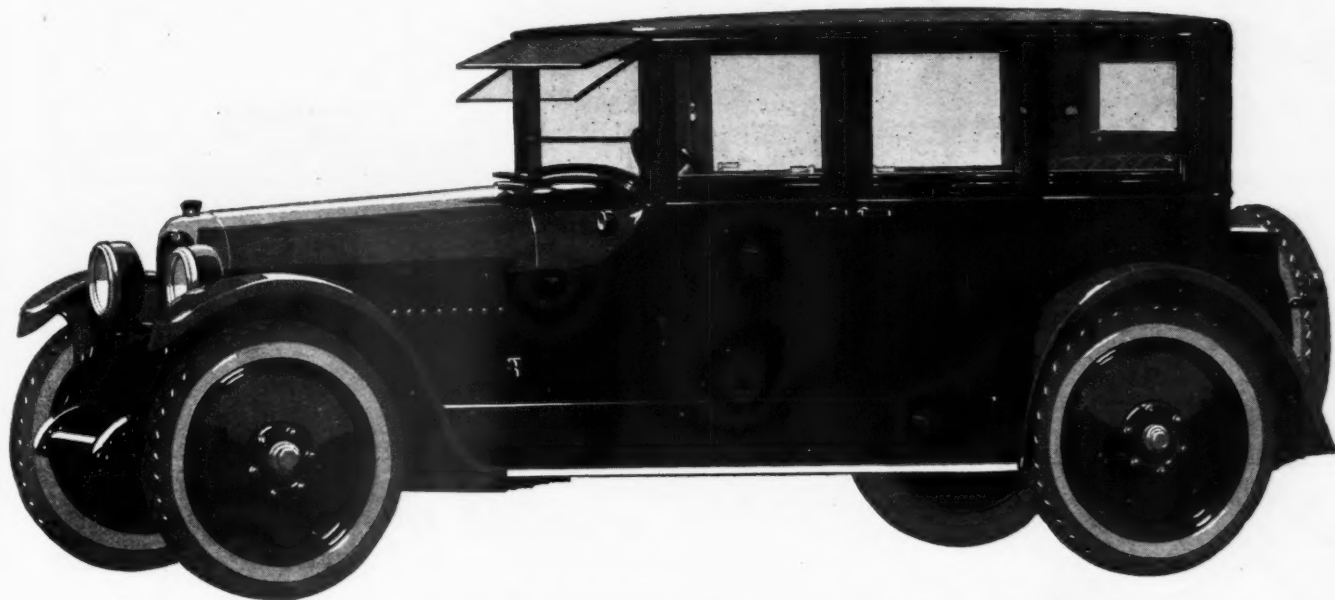
USE GENUINE PARTS—NOTHING ELSE WILL DO

Four- or six-cylinder breaker plate	:	:	:	:	:	:	\$3.00
Eight-cylinder breaker plate	:	:	:	:	:	:	3.50

AUTOMOTIVE DIVISION

CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONNECTICUT

CONNECTICUT IGNITION



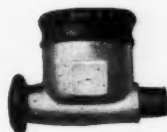
One of the selling features of the sensational Nash Four-Door Coupe

THE outstanding success of the Nash Four-Door Coupe is commonly attributed solely to its convenient, comfortable, and commodious body design. There are, however, many additional Nash features calculated to win the favor of the woman driver—now generally recognized as the most powerful factor in establishing preference for closed models. One of the most appealing of these features is the use of Oil-Kipps to assure a short-turning radius and easy steering. Each Oil-Kipp consists of a complete pumping unit contained in a die-cast aluminum cup. It is operated by merely pumping the spring plungers or pistons. The outstroke of the plunger creates a vacuum in the barrel, so that the oil is sucked into it from the cup. The instroke of the plunger puts this oil under pressure, because the plunger is so small in diameter that each pound of pressure exerted on the handle means a great many pounds in the barrel. Pressures of over twelve hundred pounds are easily obtained with the palm of the hand. With Oil-Kipps only one minute is required to lubricate thoroughly the parts essential for easy steering. In normal driving operating the Oil-Kipps once every five hundred miles is enough—and each of them carries oil enough to last several months.

Madison-Kipp Corporation, Madison, Wisconsin



Oil-Kipps



MAKE STEERING EASY



***"What the
Blankety—Blank—Blank?"
Yelled McGregor***

THE old man's choleric countenance was two shades pinker than the familiar billhead which he held in his hand, and he seemed in imminent danger of apoplexy.

Tom Morgan, proprietor of the Midville Garage, jumped to his feet and poised as if for flight, a living image, if there ever was one, of the familiar figure, "The Spirit of Speed," which he had installed on so many radiator caps.

Before he could do more than gasp, old McGregor thrust the pink bill under his nose.

"Read it and weep," he shouted. "For locating broken conductor and replacing ground wire—five dollars."

"I'm no easy mark. That ground wire is about four feet long and I'll buy you a gross of ground wires for five dollars. How do you get that way?"

Tom knew this, but he also knew that his best man had put in three solid hours locating that broken wire and that the charge was fair. He tried to explain this, but there was nothing doing.

Before he was half through the old man delivered an ultimatum:

"Either you don't know your business, or you're trying to repair automobiles with a hammer and a cold chisel. Either way I'm the goat. That job at the outside isn't worth more than two dollars. You can change this bill to that amount, or I'll pay it and it's the last chance you'll ever get to stick the harpoon into me."

The old man was right in one way and wrong in another. The bill was high, of course, but it represented honest labor. Still he was a valuable customer and Tom couldn't afford to lose him.

After the old man left, still grumbling, feeling that if he hadn't been on the job he would have been an easy mark, Tom reached for the telephone and called up his jobber.

When he got his connection he said:

"Listen, Bill! You win. Have Harry drop in this afternoon or tomorrow and get an order for that electrical testing apparatus he's been trying to sell me for the last six months."

Not only does "THE BEST EQUIPPED SHOP GET THE BUSINESS," but it holds the business it gets.

**ST
A**

Names Every Shop Man Should Know

ANY of the manufacturers listed below will help you in the selection of equipment best suited to conditions in your shop without obligating you in any way.

The Burton-Rogers Co. 755 Boylston Street Boston, Mass.

Hoyt Electrical Instruments
Ammeters
Volt Meters
Rotary Meters
Growler Sets
Magnet Testers
Cadmium Meters
Cell Meters
Mohawk Rectifiers

Weaver Mfg. Co. Springfield, Ill.

Auto Hoists, Axle Stands
Arbor Presses, Jacks
Ambulances
Tire Changers
Tire Spreaders
Wire Wheel Repair Stands
Bucket Pumps
Gasoline Cans

Mid-West Mfg. Co. Minneapolis, Minn.

Red Devil Dolly Jacks
Tire Changing Jacks
Adjustable Garage Horses
Garage Cranes and Ambulances
Burnishing Machines and
Burnishing Compounds

Frank Mossberg Co. Lamb St. Attleboro, Mass.

*Wrenchsmiths for 20
Years*

Solid Socket Wrenches
"Tee" Handles
Speeders, "Swivel Joint"
"Tee" Handles and Speeders
Special Wrenches and Tools
for Fords
Miscellaneous Automobile
Tools
Socket Wrench Sets and
Accessories
Engineers' Wrenches
Adjustable Wrenches
Metal Stampings

Continental Auto Parts Co. Columbus, Ind.

Motor Overhauling, Radiator
and Axle Stands
Piston Vises, Gear Pullers
Creepers
Wrecking Trucks
Straightening Presses
Piston Aligning Devices
Burning-in Machines

Wright Mfg. Co. Lisbon, Ohio

Wright High-Speed Chain
Hoists
Standard Screw Chain Hoists
Differential Chain Hoists
Steel Trolleys for Overhead
Track Systems
Hand Traveling Cranes

The Manley Mfg. Co. York, Pa.

Cranes—Wrecking and Floor
Presses—Garage and Arbor
Auto Hoists, Garage Lights
Garage and Service Jacks
Towing Trucks
Engine and Axle Stands
Portable Benches
Portable Tool Trays
Air and Water Stations
Truck Wheel Handler
Chassis Underworker

Bonney Forge & Tool Works Allentown, Pa.

Original Chrome-Vanadium
Drop Forged Wrenches
Original Chrome-Vanadium
Valve Tappet Wrenches
Carbon Steel Drop Forged
Wrenches of all kinds
Stillson Pipe Wrenches
Adjustable Wrenches
Combination Wrenches
Garage and Small Vises
Battery and Grease Cup Pliers
Body Iron Assortments
Special Automobile Tools
Drop Forgings

Kellogg Mfg. Co. Rochester, N. Y.

Kellogg Electric Motor Driven
Garage Compressors
Kellogg Air Towers
Kellogg Valves
Kellogg Gauges

Weidenhoff Products 4352-58 W. Roosevelt Road. Chicago, Ill.

Electrical Testing Devices
Test Benches
Battery Dischargers
Growlers
Magnetizers
Variable Speed Motors
Generating Holding Vises and
Driving Chucks
Mica Undercutters

The Jacobs Mfg. Co. Hartford, Conn.

Drill Chucks

Oxweld Acetylene Co. Newark, Chicago, San Francisco

Oxy-Acetylene Apparatus and
Supplies
Ever-Ready Welding, Cutting
and Lead-Burning Outfits

The Black & Decker Mfg. Co. Baltimore, Md.

Portable Electric Drills
Electric Air Compressors
Electric Portable and Bench
Grinders
Electric Valve Grinders
Bench Drill Stands

T. R. Almond Mfg. Co. Ashburnham, Mass.

Drill Chucks
Lathe Chucks
Micrometers, Outside
Micrometers, Inside, for Cyl-
inder Measurements

Brunner Mfg. Co. Utica, N. Y.

Air Compressors
Air Tanks
Air Hose
Air Valves
Automatic Pressure Controllers

Stevens & Company 375 Broadway New York Stevens "SPEED-UP" Tools

Piston Aligner
Microgauge
Piston Vise
Valve Reseaters and Refacers
90 Special Tools for Ford
and Fordson
Sectional Cabinets

This advertisement is published and paid for by the concerns listed above who are pioneers in the development of time and labor-saving equipment for automotive service work.

These concerns are co-operating with all automotive service men, and you are cordially invited to write to any of them for information and advice regarding the class of equipment shown below their names.

SERVICE EQUIPMENT ASSOCIATES



*"The Best-Equipped Shop
Gets the Business"*

GARDNER

The Guaranteed Car

Demands Smoothness and Dependability



Branches:

NEW YORK
CLEVELAND
CHICAGO

SERVICE STATIONS
IN 800 CITIES

*The Zenith T4X is used
on all Gardner Cars.*

The Gardner Five-Bearing Motor is noted for its freedom from vibration and its instantaneous responsiveness. It develops its abundant power smoothly and without apparent effort.

And the confidence of the makers in the quality of the car is reflected by the Gardner guaranty—the strongest in the industry.

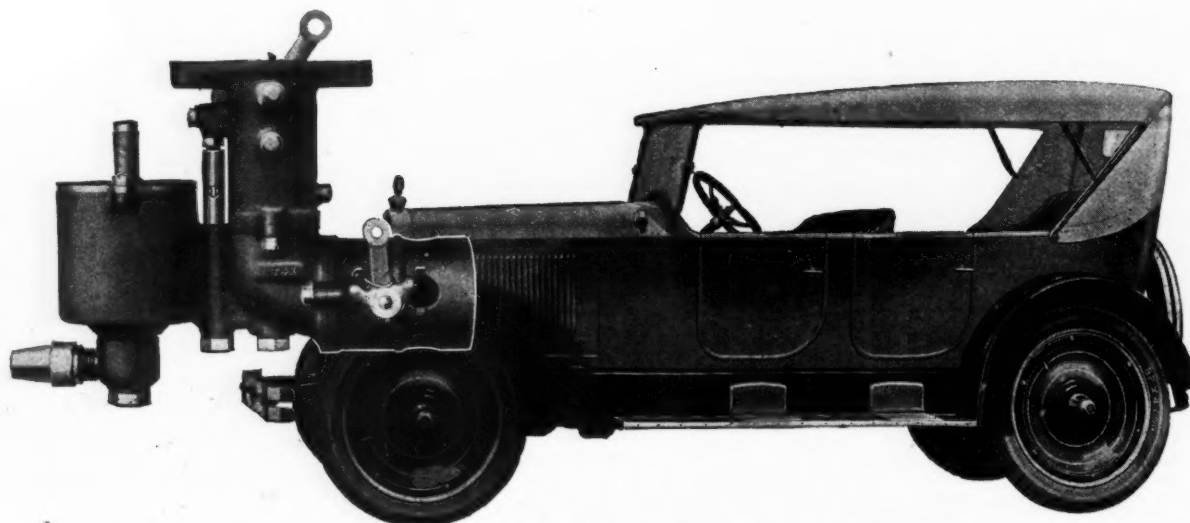
In choosing a carburetor, Gardner engineers naturally demanded one that will not in itself set up a source of vibration; and one that conforms to their standard of efficiency and dependability.

In Zenith, they find their requirements fully realized.

ZENITH-DETROIT CORPORATION

Manufacturer of

ZENITH CARBURETORS
DETROIT MICHIGAN



*The Gardner "Radio Special"—a sport model,
attractive in appearance and performance.*



TITANIC Springs are the only springs that are guaranteed **FOREVER** against center breakage—where nine out of ten breakages occur. The “hump” construction gives Titanics their unusual strength—and eliminates center bolt holes and nibs. Titanic construction leaves the spring intact. Center breakage is impossible. At the danger point Titanics are strongest. With durability Titanics combine surprising and easy riding comfort.

Titanics are as good as sold to the man who comes in for a new spring. We supply you with advertising literature, signs, and display rack for quick selling. See Chilton's or write to us direct for the name of your nearest distributor and price information.

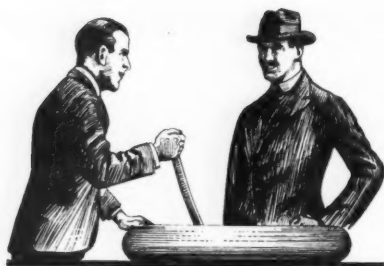
*Put our Road
signs to work.
\$50.00 worth
- with other
sales helps -
Free!
Write your near-
est distributor
listed in
Chilton's*

TITANIC

Trade Mark Reg.



SPRINGS



Ask 'em to buy



The Next Time You Sell a Tire Show This Rim Tool

YOU will find little sales resistance in selling the Red Giant Rim Tool to car owners for every one of them knows the inconvenience of removing and replacing a tire on a split rim.

Many dealers say that they find a ready sale for this device among women drivers, for it eliminates all the aggravating, tedious work attached to changing tires with a hammer or screw driver. Point out these facts to the women car drivers in your territory and you will find many sales.

Protects the Tire

The Red Giant Rim Tool will help pay for itself in saving the side of the tire from bruises and cuts, which tires receive when removed the ordinary way.

Another big selling point is that this tool can be folded up and placed in the tool box so that it does not consume much space.

By means of the reversing lugs it spreads or contracts the rim equally well and it automatically locks with each stroke of the lever.

List Price \$5.00

West of Rockies \$6.00

The reasonable list price attracts buyers, for such a sturdy tool, that will last a lifetime, appears to be worth more.

Order a dozen of these rim tools from your favorite jobber, make a window or counter display of them and watch the results. If your jobber can't supply you, write direct.

Red Giant Tool Corp.
Factory — Lynchburg, Virginia

Red Giant
THE INDISPENSABLE RIM TOOL



**Built
Especially for
DODGE
BROTHERS
CAR**

Giant Shock Absorbers

Whether you are a dealer in Dodge Brothers Cars or not you can build up a profitable business in selling the Giant Shock Absorber which is built especially for this car. The low price of \$22.50 complete attracts buyers and makes profits for you.

Simple to install—all fittings in unison with fittings of car—nothing to rattle or get loose.

Gives added riding ease and comfort equivalent to that enjoyed by owners of higher priced cars.

Territories now being allotted to live distributors—write for details.

Brake Lining Cutter

No. 739

Price, \$16.00



Mr. Punch Says:

"Any man who does a considerable amount of auto repair work, will find this Brake Lining Cutter a good investment."

To cut brake lining quickly, and clean

THAT'S the job of the Goodell-Pratt Brake Lining Cutter. Designed to cut all widths and thicknesses of brake lining up to six inches in width by one-half inch thick. Also convenient for cutting belting, shim material, etc.

The long knurled handle gives an unusually powerful leverage which is transmitted to the upper blade and transformed into a shearing motion by means of two cams, insuring an easy, clean cut. Construction is simple and rugged—nothing to get out of order.

Blades are made of carefully hardened and tempered steel. Easily removable for sharpening.

Iron parts finished in red and black enamel. Exposed steel parts are polished.

Write for Catalog No. 15

It pictures and describes the complete Goodell-Pratt line—1500 Good Tools. Free to auto dealers, repairmen and garages.

GOODELL-PRATT COMPANY

Greenfield, Mass., U. S. A.

Toolsmiths

GOODELL-PRATT

1500 GOOD TOOLS

McQUAY-NORRIS

PISTON RINGS

PISTONS

PINS

PROFITS! The leading line insures the largest turn-over. A McQuay-Norris Service Stock makes you local headquarters for Piston Rings, Pistons and Pins. It attracts orders from other repairmen, garages and dealers, as well as from car owners.

A COMPLETE LINE. A motor's *three vital units*. Essential to any dealer who wants *complete profits*. No one type of piston rings, for instance, will suit all needs. Sell the McQuay-Norris line—complete for every price and purpose.

LEAK-PROOF! The most efficient compression ring ever developed.

Supercyl! The original oil ring.

JIFFY-GRIP! The quick-seating ring with a non-butting joint that established new standards of value in the 50c field.

Snap Rings! Improved in materials and accuracy by McQuay-Norris methods.

And all these rings made of the famous Electric Iron, melted and refined in the McQuay-Norris Electric Furnace.

PISTONS AND PINS! Rounding out the complete line—all McQuay-Norris made. Enabling McQuay-Norris jobbers, service stocks and dealers to give a complete service under one long-established, nationally famous brand.

Ask your jobber's salesman to explain this opportunity for greater profits or write us direct at once Dept. M.

McQuay-Norris Manufacturing Co.

General Offices, St. Louis, U. S. A.

Connersville, Ind.

Toronto, Canada



The Complete Line

LEAK-PROOF \$1.25
 Supercyl \$1.00
 JIFFY-GRIP 50c
 Snap Rings 25c
 McQuay-Norris Wainwright
 Pistons and Pins

BOWSER

The best oil-selling outfit on the market today is the Bowser Lube-ster.

Because:

- 1 It offers an attractive display of oil—there is nothing inviting in a milk bottle full of oil;
- 2 It shows the oil—clean, dirt-proof, ready to serve;
- 3 It puts the oil into the crank-case, protected from dirt;
- 4 It moves to the car—conveniently, easily, quickly;
- 5 It insures accurate measurement—filling stations lose no oil, motorists get all they pay for;
- 6 It sells more oil in less time—you handle more customers and make more money.



Write today for folder A-14 and we will send, free, "How to Sell Him Oil, Too".

S.F. BOWSER & COMPANY, Inc.

Pump and Tank Headquarters

FORT WAYNE, INDIANA.

Sales and Service Offices and Representatives Everywhere

TANKS **DEPENDABLE** PUMPS





A Profitable Pump to Push

June — July — August — September — the four big pump-selling months are just ahead. Be ready to cash in on the demand with a stock of MONROE Self-Oilers.

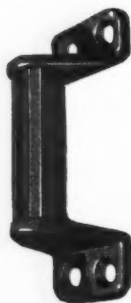
With the MONROE you can outsell any competition. For the MONROE has every advantage of any other pump — plus the patented MONROE Self-Oiling Washer, which insures certainty of unfailing service. It will not dry out as other pumps do — will not leak — will not lose compression.

Because of the steadily growing demand for this dependable, low-priced pump — and the substantial profit that every sale brings in — you'll find it a mighty profitable product to push.

Order a stock of MONROE Self-Oilers at once. If your jobber is out of them, write us direct. Full particulars and prices on request.

Monroe Auto Equipment Manufacturing Co.
Monroe Michigan

Sales Representative to Jobbers Only
The Fulton Company Milwaukee, Wis.



Other Monroe Specialties

The Monroe Brake Shoe for Fords has become extremely popular with the trade, since first offered. Cast to fit any Ford, and is assembled as shown. A quick, profitable seller.

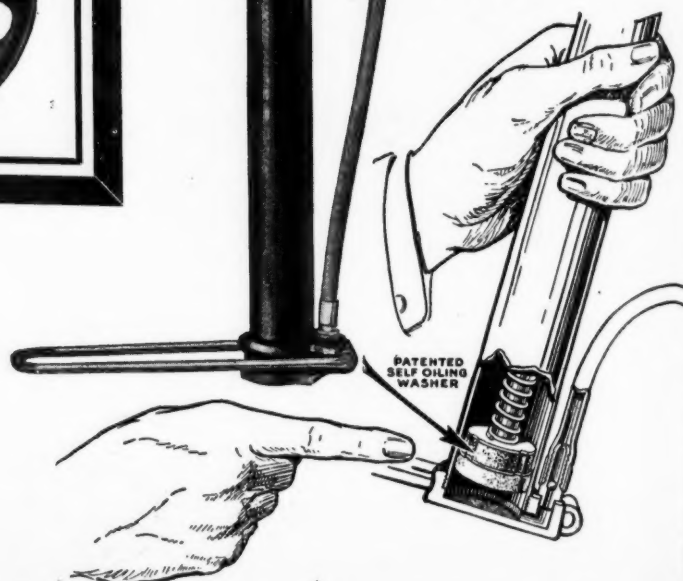
Monroe Closed Car Spot Light Brackets. Heavy cast iron, machined complete; finished in baked black enamel. Will fit practically all spotlights now sold and is easily attached to any type of closed body. A money-maker for any store.

Write for details.



This is why it Always Works

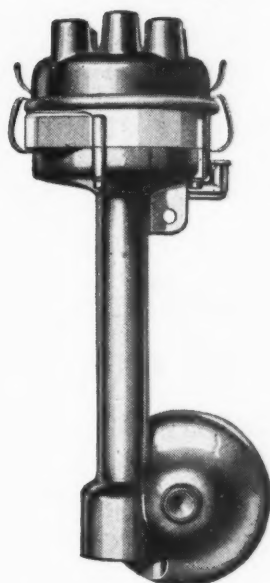
The patented MONROE Self-Oiling Washer is located just above the valve leather. Before the pump is assembled, this washer is thoroughly impregnated with a leather preserving oil. On each up-stroke of the plunger the action of the valve spring compresses the washer and releases a very small amount of oil which is absorbed by the valve leather. The leather is thus kept so soft and pliant that it readily spreads on every down motion of the plunger, completely filling the barrel and assuring maximum compression. This proven principle of construction is an exclusive MONROE feature — no other tire pump has it.



ATWATER KENT

MAKERS OF

The World's Highest Grade
Ignition, Starting and Lighting



TYPE LA FOR THE FORD

ATWATER KENT Ignition Type LA, designed especially for Ford motors, offers the Ford owner every ignition advantage enjoyed on more expensive cars. The intensely hot spark starts the motor promptly under any conditions. The automatic advancing of the spark in proportion to engine speed insures quick and smooth "pick-up." Vibration is practically eliminated at all speeds. There is greater economy of gasoline, and the system is surprisingly free from moisture, grease, or dirt troubles.

In 1922, ATWATER KENT Type LA Ignition for the Ford was proven in actual service on over 50,000 Ford Cars.

It is estimated that there will be nearly 5,000,000 Ford Cars in operation during 1923.

This presents a ready and profitable market for dealers in ATWATER KENT Equipment.

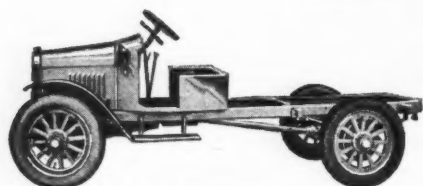
PRICE \$10.⁸⁰

including cables and fittings

ATWATER KENT MANUFACTURING COMPANY, PHILADELPHIA, PA.

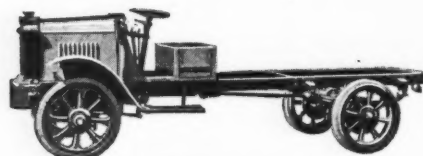
4957 STENTON AVENUE

The NEW BETHLEHEM



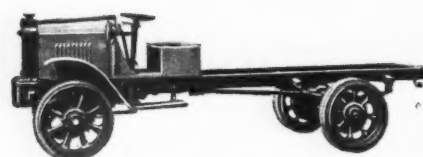
KN "AIRLINE"

\$1385



GN "FAST FREIGHT"

\$2185



HN "HEAVY DUTY"

\$2985

A fine thing to own and a fine thing to sell — the New Bethlehem Motor Truck, modern from radiator to tail lamp, Bethlehem's own make motor manufactured complete in the Bethlehem shops. Oil magazine chassis lubrication, straight line drive shafts, double reduction axles running in oil, heavy chrome vanadium steel springs, positive action brakes — made in the proper capacities to cover the largest field.

A Perpetual Contract

The New Bethlehem distributors and dealers are protected by the new Perpetual Contract — automatically renewable year after year.

THE NEW
BETHLEHEM MOTORS CORPORATION
of NEW YORK

ALLENTOWN

PENNSYLVANIA



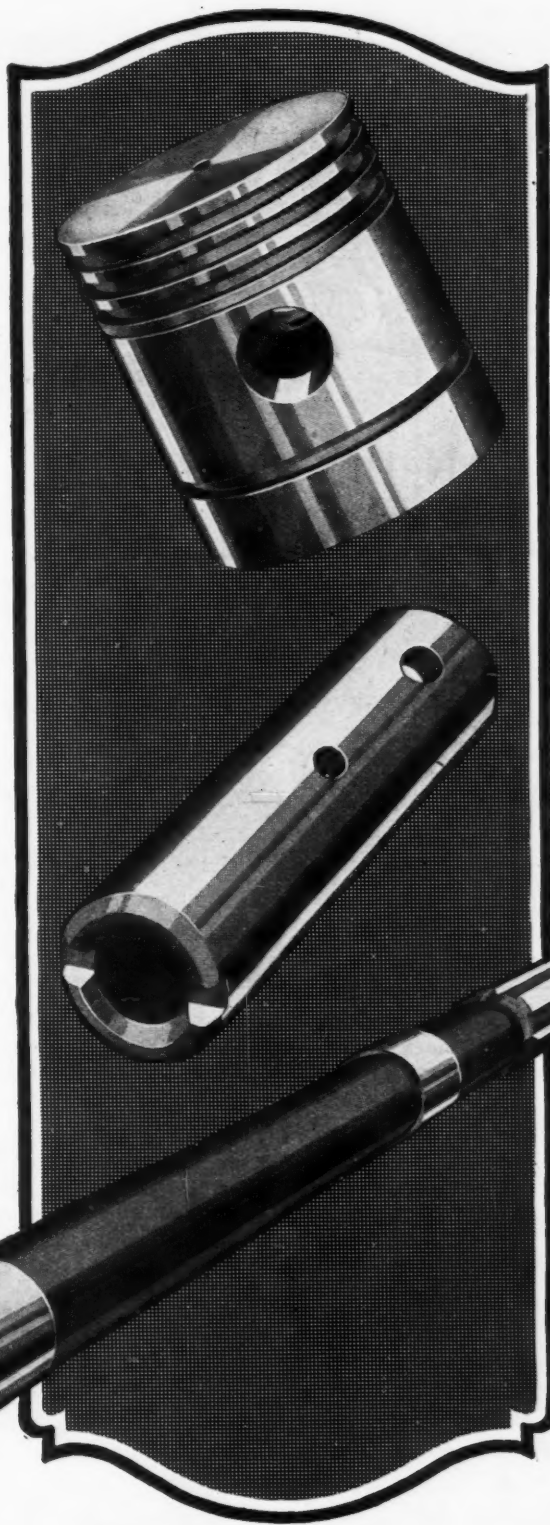
QUALITY must be considered
above all else in the manufacture of
Pistons, Piston Pins and Shafts.

We insist upon:

*Quality Material
Quality Workmanship
Quality Inspection*

And we have the equipment
that makes *Quality* possible.
Prove this by your own tests.

ARROW HEAD STEEL PRODUCTS CO.
MINNEAPOLIS, MINNESOTA

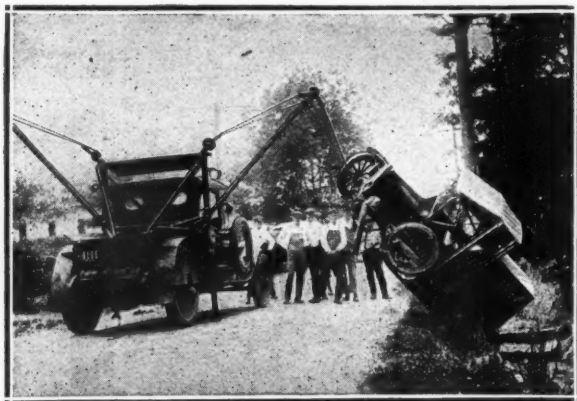


Arrow Head Products

The "Arrow Head" is Your Guarantee



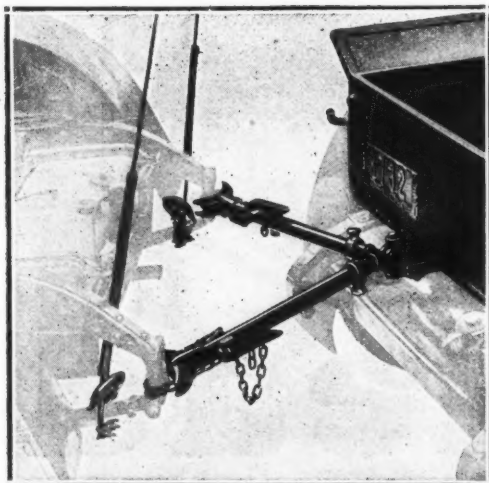
YOU CAN DO IT WITH A HOLMES WRECKER



Adjustable booms give ample clearance, making it unnecessary to block traffic or shift service car. Note extension leg carrying all load.

Holmes "V" Tow Bar

As used in connection with Holmes Automobile Wrecker.



THE Holmes patented "V" tow bar consists of two telescopic members, each provided with a universal joint at their common end. The length of each bar is adjustable from 24 to 41 inches, and this adjustment is automatically locked by spring plunger.

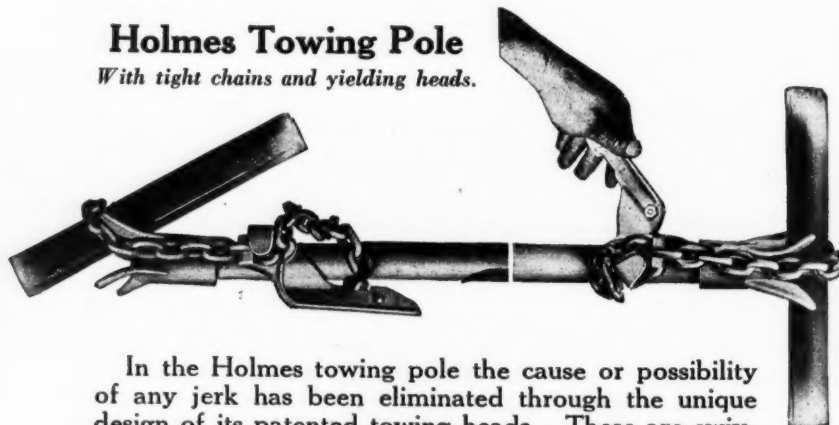
THIS is a typical wreck, car broke thru bridge rail and hung in this dangerous position, resting on engine and transmission case and partly supported by broken railing.

A very expensive and almost impossible job without the Holmes Wrecker, but a "cinch" to handle with this equipment.

By coupling the wrecked car to the service car with the patented "V" tow bars and using the two booms in parallel, the front end of the wrecked car is quickly and easily raised, clearing obstructions and carried back to safety.

Holmes Towing Pole

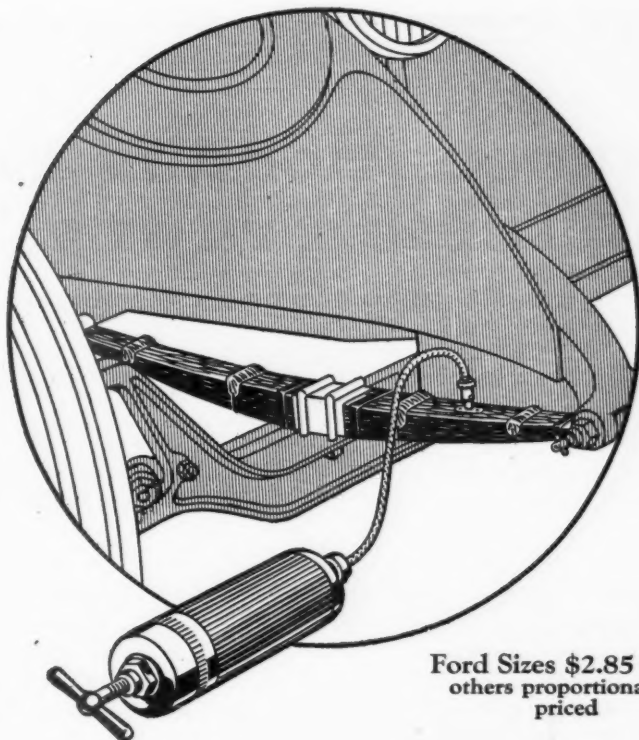
With tight chains and yielding heads.



In the Holmes towing pole the cause or possibility of any jerk has been eliminated through the unique design of its patented towing heads. These are swiveled on the pole and by means of a positive and quick acting clamping device, a rigid connection between the two cars is secured, yet permitting the free and easy turning of corners without shifting, bending or breakage. These are patented features and found in no other towing pole.

Sold only through accessory jobbers

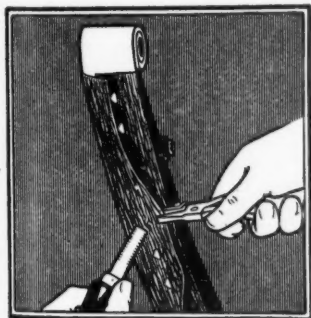
ERNEST HOLMES COMPANY
CHATTANOOGA, TENN.



Ford Sizes \$2.85 a Set
others proportionately
priced

Any high pressure feed- lubricating gun instantly attachable to the **ALBE** Lubricating Spring cover OIL OR GREASE

Equipped with hexagon
plug for which any force-
feed fitting may be sub-
stituted.



Tailored fit assured
by the Albe

THIS PRIME ADVANTAGE helps you sell car
owners using Alemite, Allyne-Zerk, Dot,
Bowen-Empress and other popular lubri-
cating systems.

Those who use grease find that one annual ap-
plication suffices to keep springs noiseless and
well lubricated because the Albe cover keeps the
grease *in* as efficiently as it keeps water, dust
and dirt *out*.

Made of high grade artificial leather — metal
bound at bottom and ends—metal-sealed joints
—smooth and clean—no laces, hooks, eyelets.
Easily applied—as easily removed if necessary.
No bolts, nuts or clips to alter or shift.

Albe Prices make Albe Covers easy to sell: Ford sizes \$2.85 a set.
Other popular sizes suitable for Chandler, Hudson, Dodge,
Studebaker, Hupmobile, etc., \$10 to \$11 a set. And they fit.

Distributors, jobbers and
dealers are invited to get
full information in refer-
ence to our liberal selling
policy. This is a wonder-
ful opportunity. Write.

The Albe Manufacturing Company
7104 Euclid Avenue :: Cleveland, Ohio

ALBE Lubricating Spring Covers



Appearance Alone Is Enough to Sell These Brawny Tires

Here is an interesting testimonial to the quick salability of Fisk Flat-Tread Cords.

It contains a profit-making sales thought for every man who sells tires—it is a whole sales manual to the man who sells cars.

The Fisk Tire Co., Inc.,
816 Main Street,
Cincinnati, Ohio.
Gentlemen:—

NELSON MOTOR CAR CO., Inc.
Ashland, Ky., April 20, 1923

When you introduced your Flat Tread Cord tires I equipped a new 55 model Buick six with 32 x 4½ flats for my personal use. The appearance of these husky tires improved the looks of the car at least 25 percent and I have been obliged to furnish your Fisk Flat Treads on all sport models I have sold. I use my personal car for demonstrating purposes and prospects who see the tire equipment will not be satisfied with anything else on the cars they purchase.

I have driven the tires 7481 miles and they do not show any appreciable wear. I expect to get not less than 20,000 miles service. The oversize feature permits a lower air pressure which of course increases the riding quality of the car. I am giving you this information in appreciation of the courtesy and service shown me by your company and feel that it is only fair to let you know the success I have had not only in the use but the sales of these Flat Tread tires.

Yours truly,
Nelson Motor Car Co., Inc.
Hays Nelson.

Ask our nearest branch about Fisk Flat-Tread Cords. Then put one in your window—because you'll sell them if you show them.

There's a Fisk Tire of extra value for every car, truck or speed wagon



THE FISK TIRE COMPANY, Inc.
Chicopee Falls, Mass.



There Will Be More Straight-Eights

But the pioneer leads the way. He tears his path into a wilderness and founds an empire with his brain and his daring.

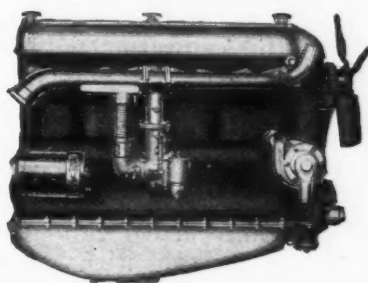
Such is empire founding in the motor world. The pioneer plunging into the engineering wilderness creates a new design and perfects it with the ripe experience of years. The skill and technique of a master are evident. Then, when the way has been opened and the trail successfully blazed there come the followers.

There will be other Straight-Eights following the original Duesenberg Straight-Eight which was pioneered and perfected by Fred S. Duesenberg by years of designing and racing experience.

The followers will also have some pioneering to do. There are a thousand mysteries in the wilderness of every new design which will have to be solved by months and years of work.

Why not be among the leaders with the Original Duesenberg Straight-Eight that was perfected long before it was offered to the public? Years from now it will still be far ahead.

DUESENBERG AUTOMOBILE & MOTORS CO., INC.
Indianapolis, U. S. A.



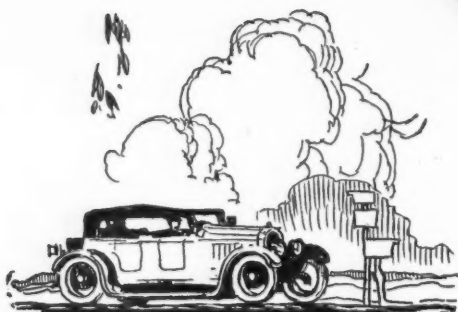
EIGHT CYLINDERS IN A LINE

Duesenberg's Straight-Eight won the Grand Prix in 1921. For more than two years it has been the only straight eight on the American market. Others will follow is the rumor. Ours has been refined, tested and proved. It will remain the one proved design and the best example of engineering practice with overhead camshaft and valves.

DUESENBERG

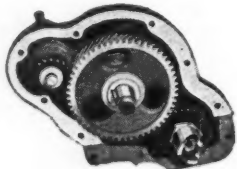
*The Original Straight-Eight
With Four Wheel HYDRAULIC Brakes*

Your demonstration car stops at the door, groomed to the minute, tuned to a hair.



To car owners

Your service station or repair man knows how to banish noise from your timing gear case. He can put Celoron Silent Timing Gears in your car. It isn't a long or expensive job. Then you will ride in comfort.



"That motor can't be running"

THE prospect comes out for the ride that will do so much to make or lose the sale. He listens for the sound of the engine. He hears—silence; but the motor really is running.

Car manufacturers are using specially designed crankshafts, bearings, and timing mechanisms, to reduce vibration and lengthen the life of silence in their engines.

They have experimented with various types of all-metal gears in their efforts to eliminate noise. They have tried timing chains which stretch with wear and thrash in the case.

Then the only remedy is to put in a new chain, a long and expensive job.

The timing train can, however,

be made *permanently positive* in action and *silent*.

Celoron Silent Timing Gears are non-metallic. They eliminate rasps, grinds, and rattles in the gear case. They are resilient, cushioning shocks and lessening wear on steel mating gears. They retain perfect timing.

Celoron Gears can be used in any timing gear train. They are already standard equipment on many popular cars.

The car-buyer takes it for granted nowadays that every car has speed, power, and endurance. He should also be able to buy silence in operation. Celoron Silent Timing Gears give your cars this quality, a distinct advantage over other cars in their class. Drop us a line for detailed information.

Diamond State Fibre Company

BRIDGEPORT

(near Philadelphia)

PENNSYLVANIA

Offices in Principal Cities

In Canada: Diamond State Fibre Company of Canada, Limited, 245 Carlaw Ave., Toronto

CONDENSITE CELORON SILENT TIMING GEARS

Make Celoron Silent Timing Gears standard equipment on all your future cars

CUTTING THE COST OF AIR

by a Dependable Compressor

SMITH Brothers run the ideal garage in Bala, Pennsylvania.

When their old compressor turned up its toes, they made up their minds to three things: The next compressor must (a) have some real capacity. (b) It must be dependable. No more of these complicated compressors, out of order every Saturday night. (c) It must not double their electric bill every month they have clear weather and customers out front.

A Franklin

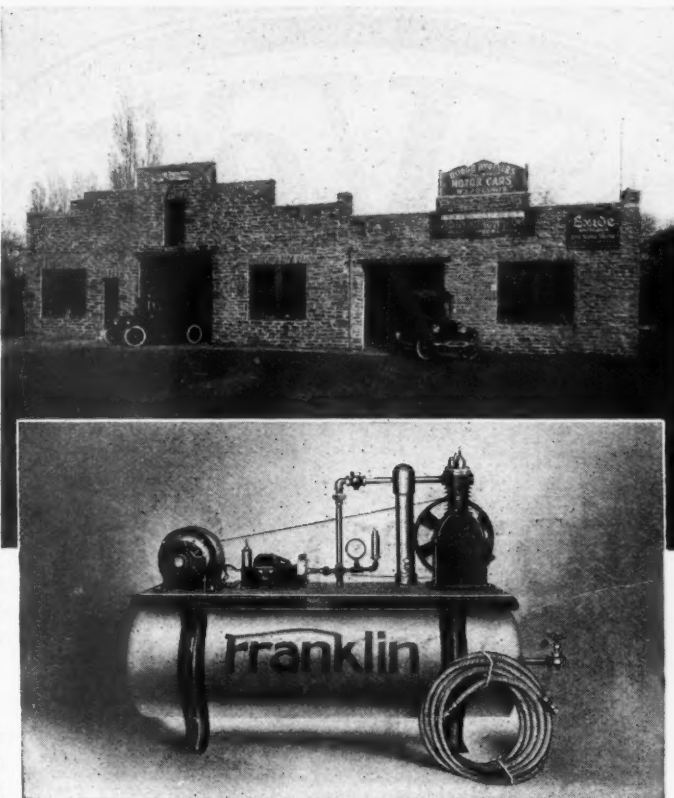
So they installed a Franklin Money Saving Compressor. It has been giving A-1 service, supplying air for 108 machines in their large garage. When the Franklin arrived, air compressor troubles were over for Smith Brothers.

Simplicity Is The Reason

Look at the pressed steel deck of the Franklin. Just as simple as a gun barrel. Nothing to get out of order. Nothing added to make it look expensive. The Franklin is made in only one size, with a 32-gallon steel tank, the size to take care of 90% of all garages or service stations. Will easily take care of a 120-car garage. Production is concentrated on this one size, therefore the price is only \$225. We concentrate on the size you want.

The Unloader

Do you know what happens when an ordinary compressor starts? The motor must start it against compression. Not with the Franklin! At starting and at low speed the Franklin unloader, or valve lift, worked by a simple cam, opens the intake valve. There is no load. The compressor, running free, immediately speeds up. Then centrifugal force throws the cam out of line and the unloader quits. The pump, now running at full speed, starts compressing. The whole thing takes but twenty seconds. Yet in that time it saves enough current, by removing



the starting load, to cut the electric bill almost in half.

Safety

The automatic pressure switch starts the motor as soon as the tank pressure falls below 120 pounds and pumps to the limit of 150 pounds in less than six minutes. For additional safety, a positive-action safety valve of our own design is set to blow at 175 pounds. Both the switch and valve are absolutely dependable. Double safety!

Other Features

Notice how the motor and compressor are placed far apart. This assures greatest pulley coverage and therefore greatest possible belt traction, eliminating belt slipping without use of an idler. The oil separator is simple, trouble-proof and effective, preventing any oil or sediment from entering the air line.

The manifold indicates the care in manufacture. The main air line pressure switch, pressure gauge and safety valve all lead from this single manifold, thus eliminating the usual half dozen

leaky nipples, elbows, etc.

G. E. Motor and Service

A General Electric motor (either direct or alternating as required) is used, and is subject to regular G. E. repair service throughout the world. Full stocks of all compressor repair parts are carried at all times at the factory and by jobbers.

Why and When to Buy

If you are opening a new garage or service station, install this most economical and dependable compressor and save money. In your present station, do not wait until that old compressor breaks down again. Summer and hard work are here. You cannot afford the time for repairs or risk inconvenience to customers. Buy a Franklin and be secure. Cut down electric bills, and have a dependable equipment which will give trustworthy service for years. Send for full particulars.

Franklin Money Saving AIR-COMPRESSOR

FRANKLIN AIR COMPRESSOR WORKS



2604 MAIN ST., NORRISTOWN, PENNSYLVANIA

SEND THIS COUPON
FOR FULL SPECIFICATIONS

Tear out and mail today to—

FRANKLIN AIR COMPRESSOR WORKS - 2604 Main Street - NORRISTOWN, PA.

Write your name and address in space below:

THE ONLY OIL RING SOLD WITH A MILEAGE GUARANTEE



Proven Quality *and* Dependability

Sav-Oil oil rings have proven their quality and dependability in years of *actual service*—installed in all makes of cars with all kinds of compression rings. They are one piece, individually cast from the highest quality soft grey iron. Each one carefully machined and inspected. Easily installed and “mike up” uniformly. “Sav-Oil” stamped on the bottom of every ring.

**Guaranteed
1000 miles
to the
Gallon of Oil**

Our guarantee of 1000 miles to the gallon of oil, or money refunded, is a sign post to *quick sales*—profitable ones too, measured in dollars and cents or in prestige and consumer satisfaction.

Live dealers everywhere are recognizing the merits of Sav-Oil oil rings. The turnover is fast and the discounts are liberal.

Territories Open for Distributors

The Sav-Oil Ring Mfg. Co.

1037 So. Figueroa St.

Los Angeles

Sav-Oil Piston Ring Co.
2056 Jackson Blvd.
Chicago, Illinois

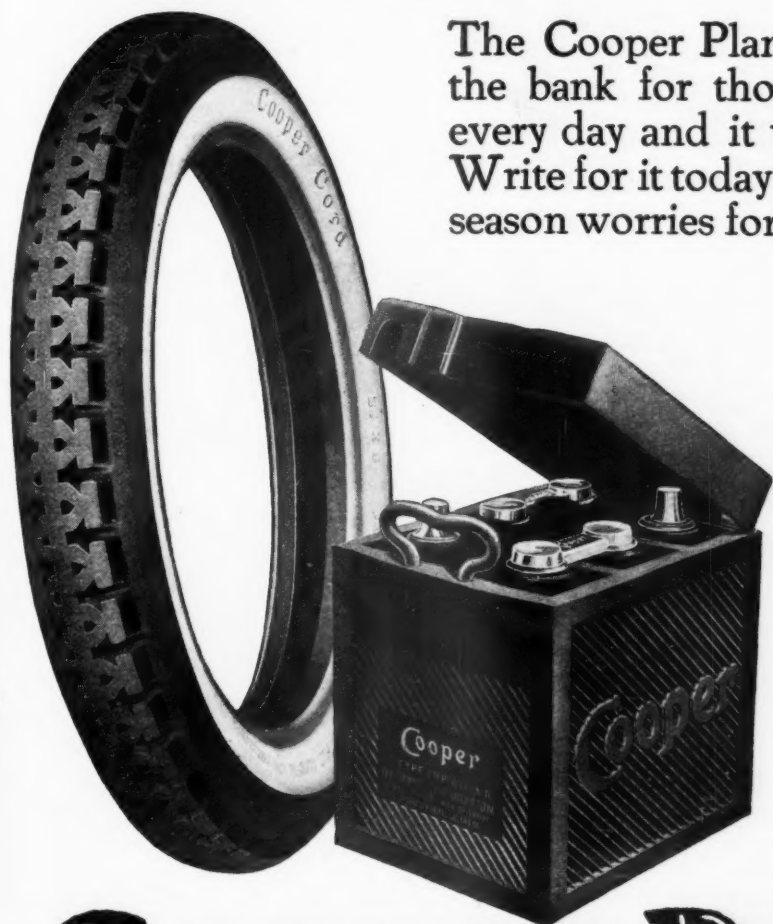
H. W. Blevins
1532 Grand Ave.
Kansas City, Mo.

Sav-Oil Ring Mfg. Co.
550 Golden Gate Ave.
San Francisco, Cal.

C. H. Mountjoy & Co.
211 Third St.
San Antonio, Texas

There are no dull seasons for the COOPER dealer

The battery dealer dreads summer and the tire dealer dreads winter, but the Cooper dealer welcomes both for he makes money the year 'round. When battery business is poor, the Cooper dealer doesn't worry—he sells Cooper Super-Size Cords. And when tires aren't selling, Cooper batteries are, and the Cooper dealer never stops making his regular trips to the receiving teller's window.



The Cooper Plan is putting money in the the bank for thousands of Cooper dealers every day and it will do the same for you. Write for it today—release yourself from dull season worries forever. You never saw or sold a better tire than Cooper Super-Size Cords nor heard of a bigger selling proposition than the new Cooper Rubber Enclosed Battery for Fords—learn more about them now.

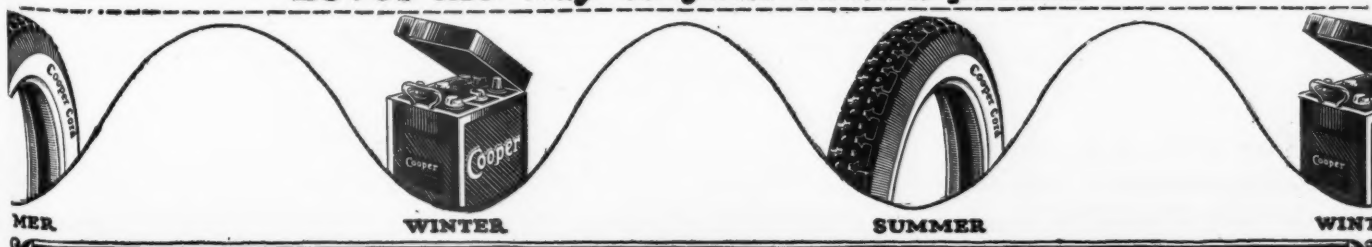
THE COOPER CORPORATION

General Offices:
Cincinnati, Ohio

Cooper Products

T I R E S B A T T E R I E S

"Level the way to year 'round profits"





1. Large Valve Opening eliminates back pressure, gives a free exit for carbon and soot. Keeps the motor sweet and clean.



2. Makes frequent Valve Grinding unnecessary. Means easy starting—quick pick-up.



3. Saves Fuel and Oil and gives more power, because much of the carbon that fouls the motor is blown out.



4. As a motor Testing Valve it gives you a clear warning of motor trouble and enables you to locate the difficulty quickly.



5. By injecting a little alcohol or commercial carbon remover in the cylinders the carbon is loosened and in a few hours may be blown out through the Cooper Special Motor Testing and Carbon Outlet Valve.



6. Easily installed in 30 minutes without cutting exhaust pipe in two—the Cooper fits around it.



7. Extra Heavy Oil tempered, drawn steel spring and heavy axle prevent flapper from chattering.



8. There's a size to fit every car.



9. It is simple, durable, practical, and low in price.



10. Standard Equipment on Paige Daytona Model and other high class cars.

Why the "Cooper" Sells Easily

While the Cooper sells on its reputation—back of that reputation stand the many practical, superior features by which this reputation was gained.

The motorist is no longer content with poor roads, nor is he content with a slovenly motor when he knows the Cooper Special Motor Testing and Carbon Outlet Valve will keep it clean, powerful and sweet running. Read the Cooper's ten points—then you'll know why it is the choice, the demand of thousands of motorists.

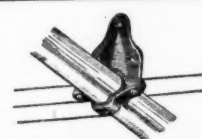


Patent applied for

\$250

Cooper Dash Control

Gives instant and positive control of Motor Testing Valve, exhaust heater valve, air chokes, radiator shutters, etc. Right at the finger tips, always in sight, fits the hand perfectly. A twist of the wrist locks it in any position. Does not interfere with levers, pedals, or floor board—a feature liked by men who service batteries. Installed by cutting a half-inch hole in dash. Made of brass and steel with exposed parts finely nicked and polished—an ornament to the finest car. Price \$2.50.



Steering Column Support for Fords

Holds steering column absolutely rigid. Takes out all vibration from steering wheel. Adds greatly to comfort of driving, especially over rough roads. A strong casting—black finish. Fits all Fords having instrument boards, both open and closed models. Packed in individual cartons—75c each.

A strictly high grade carefully machined and fitted product that cuts the cost of motoring but adds to its pleasures. The favorite of seasoned drivers, the stand-by of experienced garage and auto-men—the standard of the industry.

Prices

Valve Only

1 1/2 In.	\$2.50
1 3/4, 1 1/2	3.00
2, 2 1/4	3.50
2 1/4, 2 3/4, 2 1/2, 2 3/8	4.00
2 3/4, 2 3/8, 3	5.00
"Cooper Special" Valve complete with pedal for Fords	\$3.00

When Cooper Testing and Carbon Outlet Valve is ordered complete with Dash Control, add \$2.50 to above prices. Add 10% to these prices on the Pacific Coast. Ask your Dealer. Dealers ask Jobbers.

Manufactured by

Cooper Mfg. Co.

Dept. 15-C

Marshalltown, Iowa

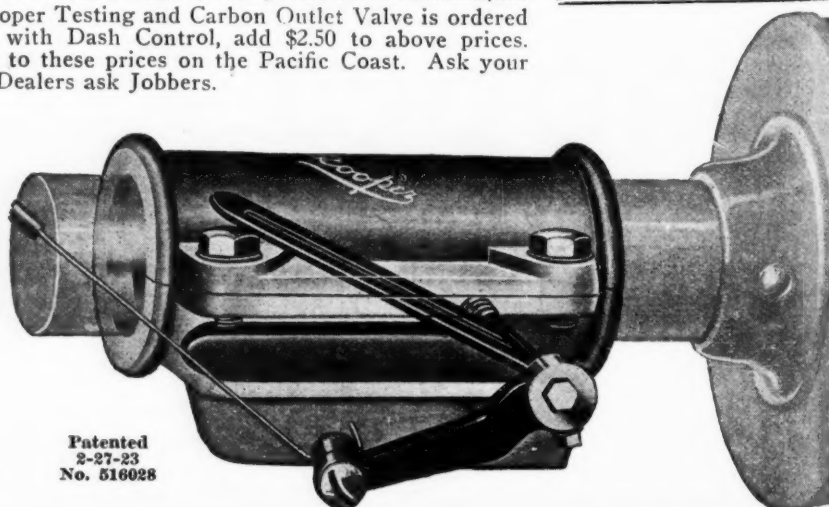
Sales Representatives

The Fulton Company

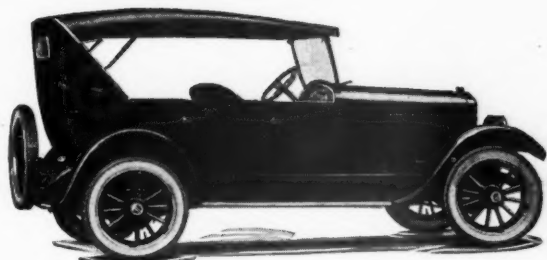
75th and National Aves.

Milwaukee, Wis.

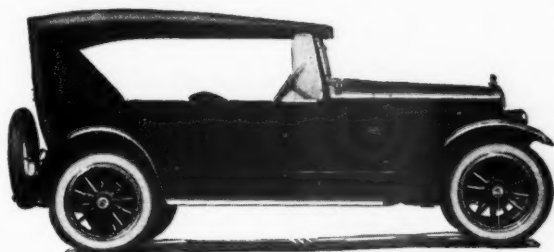
Patented
2-27-23
No. 516028



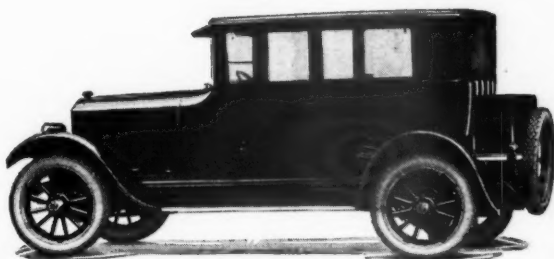
AUBURN



6-43 Touring



The Six Supreme



6-43 Touring-Sedan

The complete line of Auburn Sixes

"Six Supreme" Models

6-43 Models

Touring	\$1725	Brougham	\$2045	Touring Car ..	\$1165
Sport (fully equipped)	\$1985	Sedan	\$2345	Touring-Sedan	\$1535

(Freight and tax extra)

AUBURN AUTOMOBILE COMPANY
Auburn, Indiana

We hit 'em where they live!

HERE are two chassis that are just what the public wants.

A Smaller Six at \$1165 that performs like the best of the big cars, supplies the growing demand for more economical transportation, with distinction.

A medium priced six at \$1725 that is not an old gray mare, but a car of wonderful pep and power capable of seventy miles an hour with the quickest pick-up and the best hill-climbing ability you ever saw — the Six Supreme.

These cars tap the two great six-cylinder markets. With the big range of bodies they fill every six-cylinder need.

And they have the looks, the quality, and the downright value that makes them sell. They have also some new and striking features that are wonderful talking points.

Dealers Are Signing Up!

Auburn has signed up more new dealers and distributors in the past few months than ever in its history.

This is why Auburn production has had to be increased again and again to meet the demand of the country for these cars.

This is why Auburn dealers are making more money this year than they have ever made.

Act now, your territory may be open. Write today for the details of the non-expiring franchise, the big national advertising campaign, the liberal support in your own territory.

ONCE AN OWNER



ALWAYS A FRIEND

LINCOLN



Public and Trade Are Enthusiastic About Lincolns

Dealers have discovered definite and advantageous reasons for handling Lincolns, namely: Six models provide for all cars built; Lincolns are easily installed—less than an hour being required to completely equip a car; their design and construction features make them last longer and act faster—cushioning the heavy shocks and minor vibrations.

In the light of the universal satisfaction they are giving to thousands of users it is not surprising that they are now known everywhere, and that the demand is mounting month by month.

Lincoln Shock Absorbers are Nationally Distributed by More than 100 Leading Accessory Jobbers—Sold by Good Dealers in All Territories. *Lincoln Advertising Appears Regularly in The Saturday Evening Post.*

For All Cars—\$15 to \$36

LINCOLN PRODUCTS COMPANY
1253 So. Michigan Ave. Chicago, Ill.

SHOCK ABSORBERS

Prices Reduced

on
Comfort's
Triplicate
Repair
Order
Form
No. 100

3,000,000 Sold
in the Last
Sixteen Months

Comfort Gives You the Bene-
fit of Increased Production

Comfort form 100

THRIFT AND SAVINGS AUTO CO., Libertyville, U. S. A.
REPAIR ORDER

NAME *Mr. Hartley Baxter* No. *792*
DATE *Jan. 7* 192*2*
PHONE NO. *2421642*
MOTOR NO. *2643791*
CAR NO. *2421642*

ADDRESS *1910 Olive St.*
MAKE AND MODEL *Ford Reinhardt*
LICENSE NO. AND STATE *30653 Mo.*

TERMS STRICTLY NET CASH

INSTRUCTIONS

INSTRUCTIONS	SALE AMOUNT
15 Clean Carbon and Grind Valves	9.60
25 Stop Oil leak around Crank Case	90
31 Install new Commutator in right headlight	60
509 Install new reflector in right headlight	70
258 Install new left rear fender	70
311 Install new left rear fender	70
175 Tighten clips on front spring	70
Wash Car	1.50
TOTAL LABOR ONLY	9.60
MATERIAL (See other side for List of Parts)	9.81
TOTAL AMOUNT	19.41

ABOVE PRICES FOR LABOR ONLY. PARTS EXTRA.

DATE PREPARED *Jan. 10* 192*2*
DATE COMPLETED *Jan. 9* 192*2*
SERVICE—WE WILL BE RESPONSIBLE FOR LOSS OR DAMAGE LEFT IN CAR, IN CASE OF LOSS BY FIRE OR OTHER CAUSES BEYOND OUR CONTROL.

AUTHORIZED BY *H. Baxter*
RECEIVED BY *H. Baxter*

PRICES F. O. B.
YOUR CITY

500 Sets—\$10.20 1000 Sets—\$14.80 2500 Sets—\$34.40 5000 Sets—\$61.20

Printing name and address on the original and duplicate sheets only, \$2.00 per thousand sets extra. If less than 1000 is ordered, the printing charge will be \$2.00.

Numbering all three sheets, \$1.50 per thousand sets extra.

Punching charge, 60 cents per thousand sheets.

Avail yourself of this opportunity now. Order today. We pay all the transportation charges to you.

COMFORT
Printing Specialty Co.
101 N. EIGHTH ST. ST. LOUIS, MO.

Sufficient Supply of Carbon Paper with Every Order

Special 5000 Quantity Price

5000 Repair Orders with name printed on 1st and 2nd copy \$66.20

5000 Repair Orders name printed and all three copies numbered 71.20

Comfort Printing Specialty Co., 101 N. 8th St., St. Louis, Mo.

Please ship us the following by Parcel Post or Express—Prepaid by Comfort.

.....Form No. 100 Triplicate Repair Orders \$.....

.....Imprinting, numbering and punching.....

Name

Address

City State

Send your letterhead if name and address is to be imprinted

A Vital Point for the Reader of this Paper

A B P STANDARD No. 1

"To consider FIRST the interests of the subscriber."

EVERY member of The A B P Inc., of which this paper is one, has subscribed to this and to *nine other* standards covering every department of publishing practice. The A B P label stands for all that is best in publishing; the things which make a business paper one of the essential working tools of the successful business or professional man.

In interpreting Standard No. 1 the constitution bars from membership papers of free circulation, publications which are owned directly or indirectly by an association or an advertiser; and in the words of the constitution itself, —member papers "must not be organs or mouthpieces of any house or combination of houses to further its or their special interest as against the joint interest of the trade or class."

This assures you of a paper without prejudice or bias; one which must be independent of any consideration other than the common welfare of its field.

Because such a paper must have a legitimate PAID circulation, its control is wholly in the hands of the subscrib-

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This is not true of the paper with a circulation controlled by the ones who issue it; which goes to you whether or not it is needed or wanted. The obligation of such a paper necessarily is to its advertisers or whatever interests may be back of it.

The A B P type of paper *must* earn and deserve your approval,—you control its circulation, its life. It *must* render you adequate service; it *must* fight your just battles; it *must* deal fairly with every factor with due regard to the rights of other factors. Enlightened selfishness justifies the fullest support of such a publication.

Standard No. 1 is placed first because it IS first in our conception of publishing practice. Everything else is secondary to the main purpose of serving the subscriber with courage and unswerving fidelity.

THE ASSOCIATED BUSINESS PAPERS, Inc.

JESSE H. NEAL, Executive Secretary

HEADQUARTERS:

220 WEST 42nd STREET

NEW YORK CITY

GATES BELTS

"The Standardized Fan Belt"

It's the patented bias weave that gives the positive grip on the pulley—and this insures a cool engine. Another reason why Gates Vulco Belts out-sell all other kinds.

Made by the World's Largest
Manufacturers of Fan Belts.



H & G
Universal Set complete
with Speed
Wrench

140 combinations all in this ONE set

Mechanic's Dream Comes True

THE H & G Universal Socket Set complete with Speed Wrench takes the place of a wheelbarrow full of single-purpose tools.

In this set you have everything you need in the way of a wrench. You take it with you from car to car. No time is wasted trying to find the proper wrench.

The application is rapid and natural. The nut to be loosened or tightened determines the socket to be used, which is done at a glance. Its location determines what attachments are required, and they are instantly snapped on and the job is done.

Easy, simple, quick, practical—the better way.

* * *

The Sockets, which are the heart of any set, are stronger, and permit the mechanic to use his strength. They are cold-drawn from bar stock by the Allen Process and are specially heat-treated. Just the right thickness to combine proper margin of safety in strength and still be thin enough to be used everywhere.

Superior in design, strength and workmanship, this set of wrenches will save your time and temper because it is a real tool for real mechanics.

Ask your dealer. Write for literature.

The Eastern Machine Screw Corporation
10-20 Barclay St., New Haven, Conn.



MOTOR TRANSPORT

MOTOR TRANSPORT, formerly *The Commercial Vehicle*, is devoted to the development of the art and science of motor transportation as it applies to the transport of commodities by Motor Truck, the transport of passengers by Motor Bus and the transportation of both by Gasoline Railroad Car.

Addressed to the Fleet Owner and those concerned with the operation of fleets—its mission is to analyze all problems which properly come within its scope—and to assist in the solution of these problems by means of editorial discussion.

The six major problems which the Fleet Operator has to contend with in the handling of his fleet, and which MOTOR TRANSPORT helps to solve are

<i>Cost of Operation</i>	<i>Handling Drivers</i>
<i>Systems of Operation</i>	<i>Maintenance</i>
<i>Problems of Organization</i>	<i>Legislation</i>

Each issue of MOTOR TRANSPORT has articles based upon the factors outlined above and these articles are written from first-hand investigations and study by our editors in the field.

MOTOR TRANSPORT is published semi-monthly, on the 1st and 15th. The subscription price is \$2.00 per year (\$2.50 West of the Mississippi).

Write for a sample copy

MOTOR TRANSPORT

(Published by the Class Journal Co.)

239 West 39th St.

New York, N. Y.



Berkshire Electric Windshield Wiper

Not a luxury but an actual necessity. Designed by Automotive Engineers and built by Electrical Specialists. Two years spent in its development. Thousands in service. Will operate at regular speed regardless of the speed of the motor. Rugged, Silent, Economical and Efficient.

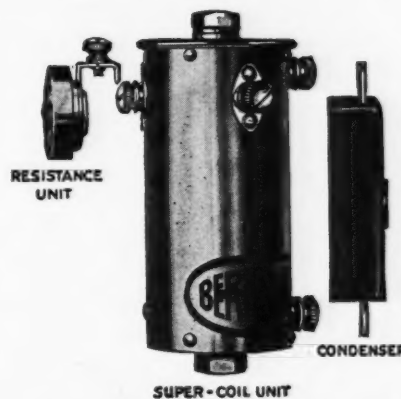
Is furnished with or without mirror. Weighs less than two pounds and requires less than four amperes to operate.

Retail price, Wiper, \$9.50; Mirror, \$2.50.

Berkshire—J & B TIMER for the FORD CAR or TRUCK

The Old Reliable J & B Timer. A standard for years. Known to the discriminating Ford-owner and the progressive Dealer as being *long-lived, dependable and efficient*. It is built by Ignition specialists and is designed to synchronize with the motor in the Ford Car, Truck or Tractor. Rugged and fool-proof. Guaranteed to fit, to serve and to satisfy.

The Lowest-Priced High-Grade Timer Built. Retail for \$1.50



Berkshire Super-Coil for Replacements

The Berkshire Super-Coil is interchangeable with every make of battery ignition coil. With its detachable resistance elements and condenser and three simple bases any car can be fitted by the most inexperienced mechanic. No necessity for tying up a lot of capital in slowly moving stock—an investment of less than \$8.00 puts you in position to make any coil replacement on any car using battery ignition.

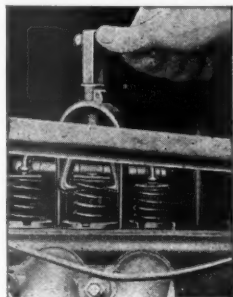
Get a **UNIVERSALLY INTERCHANGEABLE Service Station Set** from your Jobber

BERKSHIRE—J & B TOOLS



The Berkshire—J & B Buick Rocker Arm Lifter

A time, temper and money saver. Indispensable to the shop repairing Buick Cars. It lifts the Rocker arm clear of the ball end of the push rod. This allows the push rod to be sprung out of place, after which the Rocker Arm can be revolved on its axis away from the valve stem, giving free access to the valve cage spring and stem. Simple, durable and practical. Made of Alloy Steel, Drop-Forged. Rust-proofed. Retail Price, \$2.00.



The Berkshire — J & B Buick Valve Cage Remover

Gain access to the inside of the Buick Motor. The Valve Cage Remover comes into action after the Rocker Arm is free from the Valve Stem. The Valve Cage Remover grasps the two top coils of the Valve Cage Assembly Spring and gradually draws the valve cage clear without bending the Valve Stem. Both the Valve Cage Remover and the Rocker Arm Lifter can be used without disturbing the water pipe connections or any adjacent parts. Made of Alloy-Steel, Drop-forged. Rust-proofed. Retail price\$5.00



The Berkshire — J & B Bushing Remover

Every Repairman has experienced difficulty in removing stubborn bushings, particularly those in the Spindle Body of the Ford. This Bushing Remover is the solution. Quickly removes any bushing of half-inch diameter. A necessity in every Garage and Repair Shop. Thousands in daily use. Drop Forged from Alloy Steel. Rust-proofed. Retail Price.....\$1.00



The Berkshire — J & B Buick Wheel Puller

Meets the difficult problem of removing wheels from full-floating rear axles. Designed by an expert on wheels and axles. Easily operated and pays its first cost in a day's time. Remove the flange nuts, driving flange and axle—place the wheel puller over two directly opposite bolts, use two of the flange nuts to hold it. Turn the central screw with a wrench until the plate is in contact with the axle tube—the wheel comes off squarely. Made of alloy steel, drop forged. Screw is of selected machine steel. The whole is rust-proofed. Retail Price\$3.50

Manufactured by

BERKSHIRE PRODUCTS CORPORATION

Successors to - J & B Manufacturing Co. Berkshire Magneto Co.
"Automotive Equipment Manufacturers for Almost a Quarter Century."

PITTSFIELD, MASSACHUSETTS U. S. A.

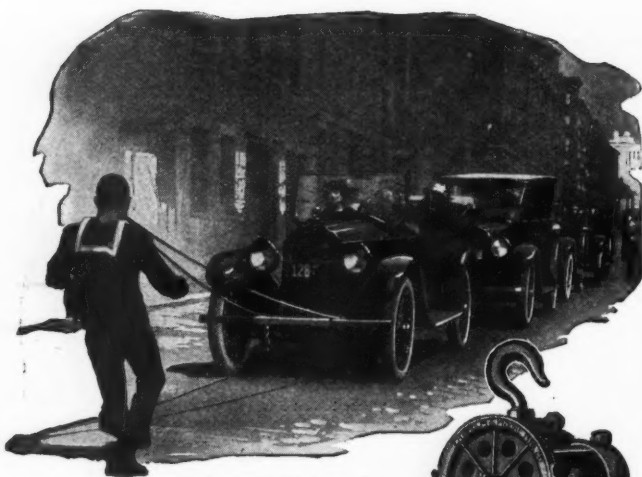


Photo Underwood & Underwood.

A Strong-jawed Boatswain of the U. S. N. tows three automobiles through Boston streets in this fashion.

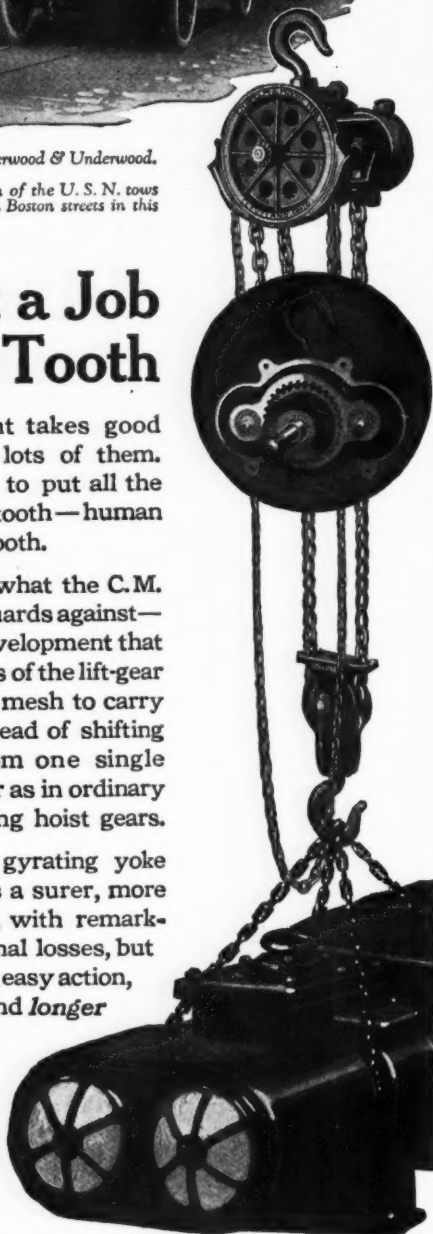
It's Not a Job for One Tooth

SUCH a stunt takes good Teeth—and lots of them. It's hardly safe to put all the strain on one tooth—human molar or gear tooth.

That's exactly what the C.M. gyrating yoke guards against—an exclusive development that keeps two-thirds of the lift-gear teeth always in mesh to carry the weight, instead of shifting the weight from one single tooth to another as in ordinary circular rotating hoist gears.

This patented gyrating yoke not only means a surer, more powerful drive, with remarkably low frictional losses, but insures smooth, easy action, higher speeds and longer service!

Catalog covering Hoists, Cranes and Trolleys sent on request.



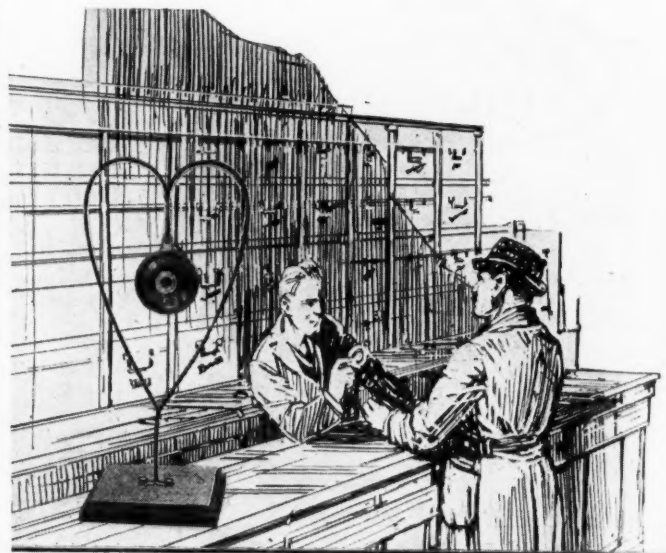
The Chisholm-Moore Mfg. Co.
Cleveland, O.

NEW YORK CHICAGO PITTSBURGH

CYCLONE
HIGH SPEED

The hoist with
the gyrating yoke

HOISTS



Put This Display Stand On Your Counter

Here is a real merchandising idea that will make many ready sales on the Bell Timer for you. An unusual striking display stand, that is furnished Bell dealers who order 10 timers or more—so that customers can inspect the construction of the timer at their own convenience.

The case of the Bell Timer is made from Bakelite: dust-proof, waterproof, leakproof. Contact is copper to copper—reducing wear to a new low minimum. The self-adjusting contact shoe on the rotor is so constructed that it **MUST** maintain an even pressure against the raceway—compensating for all irregularities of cam shaft motion. An accurately timed, economically operated motor is assured.

Every dealer and jobber will be interested in our special trade offer. Full information on request.

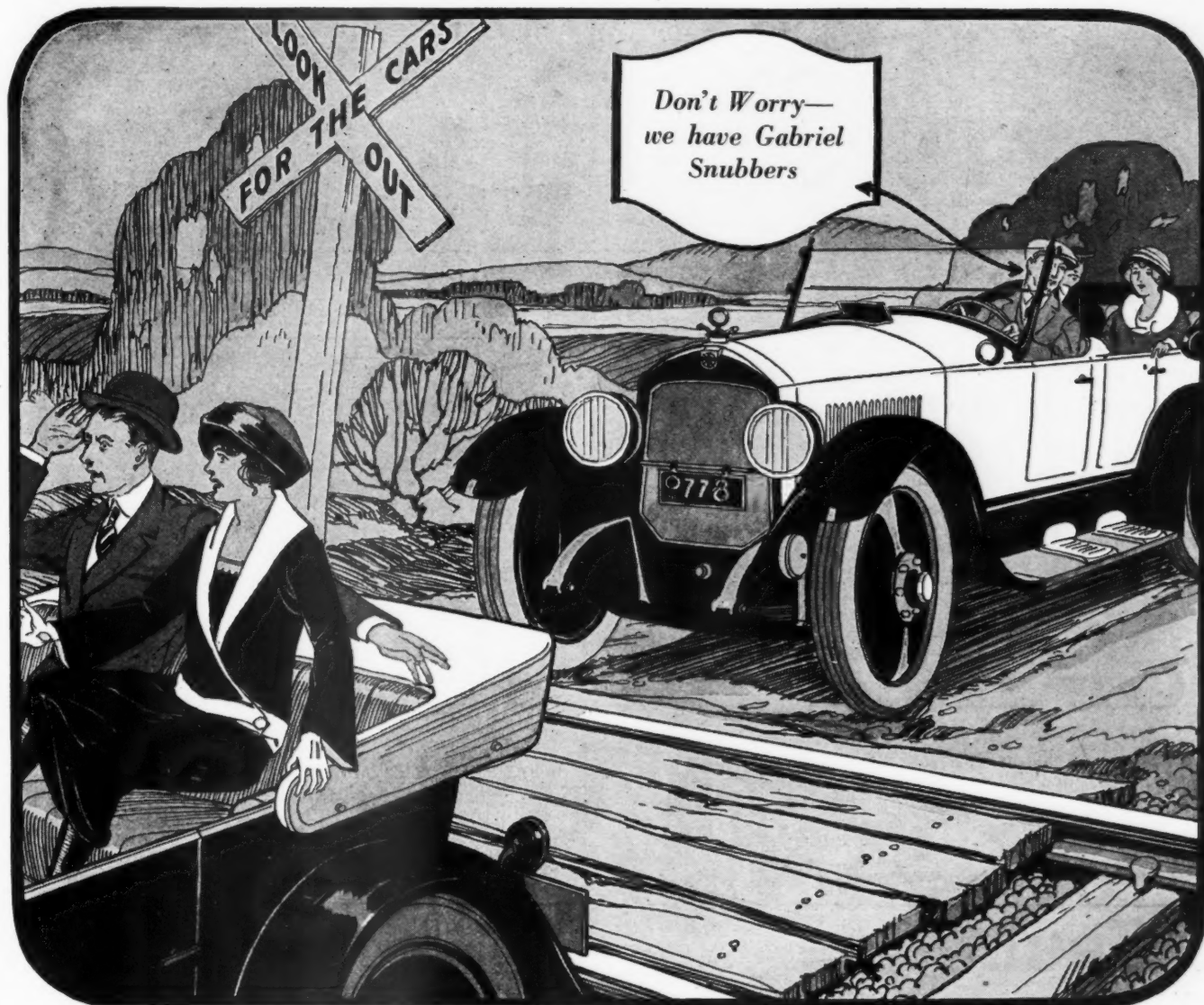
BELL MANUFACTURING CO.,
Boston, Mass.

The **BELL** Timer



With the Bell Rotor, perfect contact and accurate timing is assured. A special spring bears against the contact shoe, and if there is any end play of the cam shaft the spring coils automatically wind and unwind—maintaining a constant even pressure on the raceway.
Send for illustrated descriptive data.

List Price \$3



SOME people are still "bumping the bumps" because they do not know the value of Gabriel Snubbers. 37 cars are standard-equipped—manufacturers of 34 others put holes in frame for them, thus recognizing their value.

Sold by Legitimate Dealers

GABRIEL MANUFACTURING COMPANY
1415 East 40th Street Cleveland, Ohio

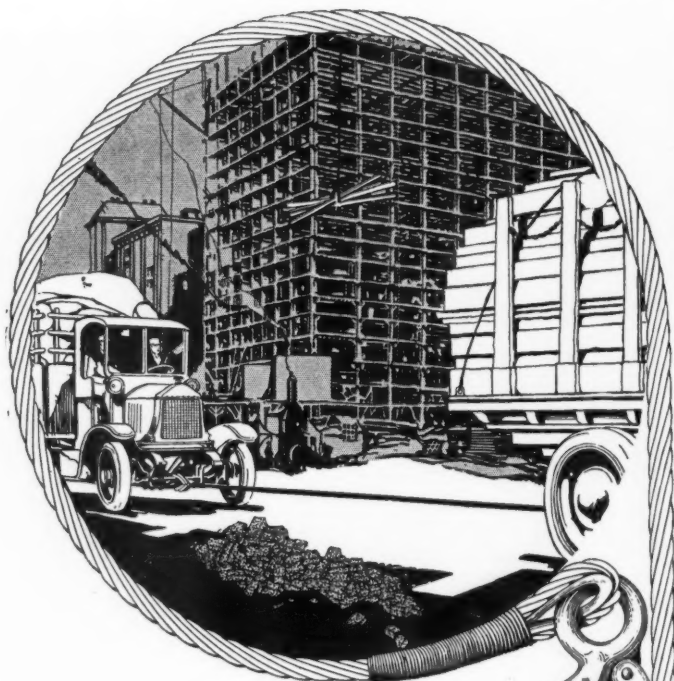


Keep You on the
Seat
Save Your Car

GABRIEL
SNUBBERS

THERE IS NO OTHER

If it's a Snubber
—it's a
"GABRIEL"



On Time!

Time is money with a motor truck. Delays eat up profits and stall production. Safeguard against them by equipping every truck with a

POWERSTEEL TRUCKLINE

This dependable towline would hold an elephant. It's made of world-famous Yellow Strand Wire Rope. Attaches instantly, securely. Retails, east of Rockies, at \$8.65 with plain hooks; \$10.10 with patented Snaffle Hooks.

BASLINE AUTOWLINE is a smaller line, for towing passenger cars. Also made of Yellow Strand Wire Rope. Can be used to pull car out of ditch on your own power. It's the "Little Steel Rope with the Big Pull." Patented Snaffle Hooks. At dealers, \$4.95 east of Rockies.

POWERSTEEL AUTOWLOCK, also made of Yellow Strand Wire Rope, is protection against car or spare tire thieves. Has sturdy, non-pickable spring lock. At dealers, \$2.50 east of Rockies.

NATIONALLY ADVERTISED

There are two reasons for the enormous demand for the 3 B & B Accessories. First, of course, is their *quality and dependability*. Secondly, they are backed up by strong, sales-making advertising in the leading National publications. On top of that, they pay jobbers and dealers a *good profit*. If you're not already pushing these 3 money-makers write for our proposition.

BRODERICK & BASCOM ROPE CO.,

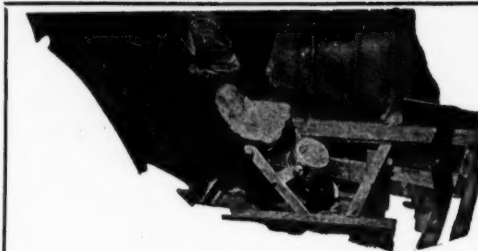
ST. LOUIS—NEW YORK

Manufacturers of Celebrated
Yellow Strand Wire Rope

D10F



FINDS THE WEAK CELL



—without taking
battery out of car

A HOYT Cell Tester will save you lots of time, for when a patron drives up and reports battery trouble, you don't have to waste many precious moments fussing with various instruments, meters, etc., to find the weak cell.

Take the Hoyt Cell Tester, place its two sharp steel prods, one on the positive, the other on the negative terminals of the individual cells — and read direct. It makes a positive contact and you can tell the condition of the battery cells at a glance.

A Hoyt Cell Tester in your shop gives the kind of accurate, speedy service that will please both you and your patrons.

Our new edition of "Hunting Down Electrical Troubles," describing this repair shop necessity, and other Hoyt instruments will be sent on receipt of ten cents—to cover postage.

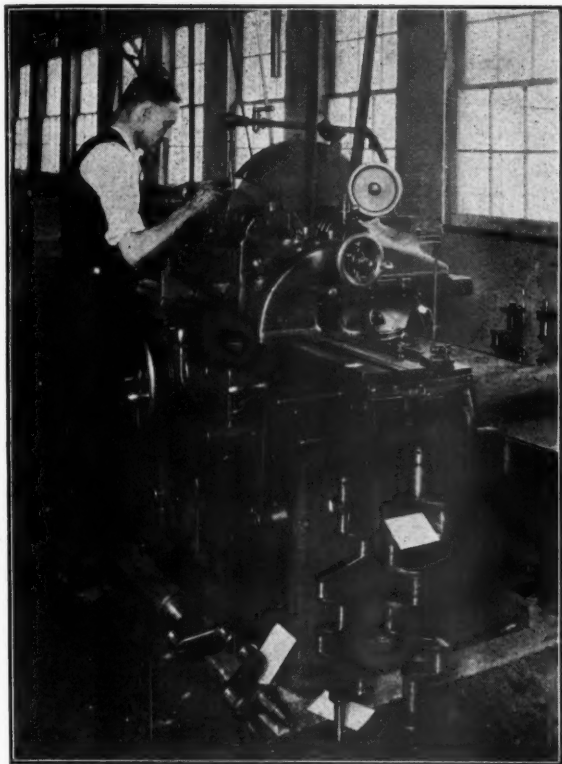
THE BURTON-ROGERS CO.

Sales Department—Hoyt Electrical Instruments
755 Boylston Street, Boston, Mass.

Hoyt Instruments May Be Purchased From Your Jobber
Branch offices and Distributors in all principal cities

**"The Best-Equipped Shop
Gets the Business"**





Complete LANDIS equipment in the up-to-the-minute plant of the Precision Motor Re-Grinding Co., Hohokus, N. J. Mr. McWane states that he is 100% sold on his LANDIS Grinding Machines and cannot imagine what could be added to them to increase their efficiency.



With these two—

You're Equipped

THERE is money to be made in being **THE GRINDING SPECIALIST** in your community. Every community should have the advantage of a **REAL** grinding shop—where garages and repairshops for miles around will send their cylinders, crankshafts, etc., for resizing.

The **LANDIS CYLINDER GRINDING MACHINE** is especially well suited for resizing work. Nothing complicated like some machines with their 10 to 12 speeds—the Landis has but 2 traverse speeds, 2 eccentric speeds, 2 spindle speeds. Comes **COMPLETE**, ready to tackle any regular job without putting you

to the expense of extras. Hundreds in use—making good, every one.

The **LANDIS 4-A SPECIAL GARAGE GRINDING MACHINE** is a suitable companion machine for crankshafts, pistons, pins, king-bolts, etc., etc.—whatever needs grinding. Built especially for automotive service work—not manufacturing.

These grinding Machines represent the highest refinement of design and construction, by the largest grinding machine manufacturer. High grade machines—high grade **SERVICE**. You will be **MORE THAN INTERESTED** when you compare Landis **PRICES**. Catalog upon request.

LANDIS

LANDIS TOOL CO., WAYNESBORO, PENN.

New York Office: 51 Chambers Street

Better than Shellac

GASKO-CEMENT
BETTER THAN SHELLAC

Get Acquainted with **GASKO!**

VAN SICKLE MFG. CO.
LINCOLN, NEBR.

WRITE TODAY

for trial tube — 25c in stamps will bring it—that will prove more than anything we can tell you.

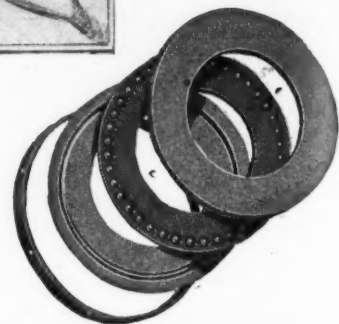
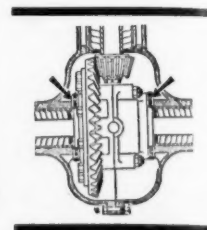
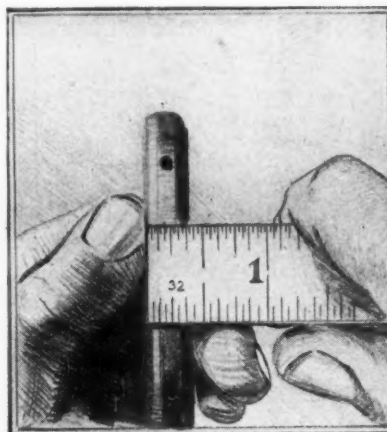
USE IT

— for setting gaskets in Auto or Marine engines, gas or steam engines, for sealing pipe unions, pressure tanks, for oil pans, hub gaskets, etc., etc., etc.

GASKO HAS PROVEN SATISFACTORY under every known test.

Give us your Jobber's name

VAN SICKLE MFG. CO.
LINCOLN, NEBR.



4,850,000 Fords —and they all need this!

Nearly 45% of ALL passenger cars now registered are FORDS. This gives you the biggest repair opportunity you have ever had.

All you need do is to show a Ford or Chevrolet owner how a Bantam F-40 reduces friction to a minimum.

Bantam F-40 takes the place of the plain washers now in the Ford Axle. It is built for hardest service.

Every owner wants better hill climbing, greater gas mileage, freedom from noisy gears and axle trouble. You can install F-40 in 90% of these cars in your town.

Your distributor carries F-40. If he cannot supply you, write to one of the addresses below.

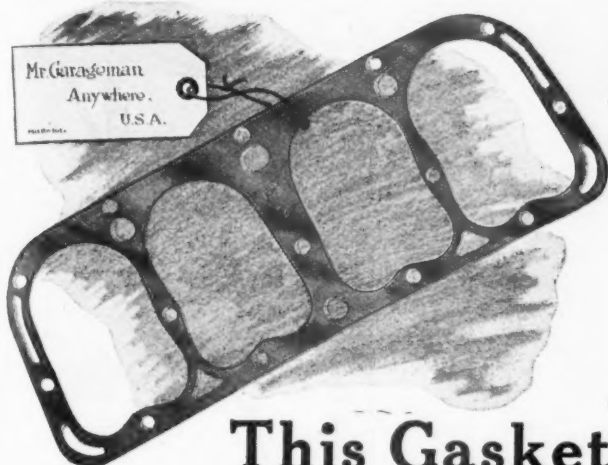


BANTAM BALL BEARING CO.
Bantam, Connecticut

Detroit Office,
905 Dime Bank Bldg.

Mr. F. M. Boyd, The Avon,
6 East Read St., Baltimore, Md.

Frank M. Cobbledick Co.,
1031 Polk St., San Francisco



This Gasket **FREE**

*Simply send us your name if you
sell or use Never-Leak Gaskets*

WE want every dealer and garageman, handling or using **Never-Leak BOUND EDGE Gaskets**, to take advantage of the new service we have arranged for his special benefit.

If you sell **Never-Leak**, your name should be included on the list for this free service—so don't fail to get it in to us at once, together with your business address.

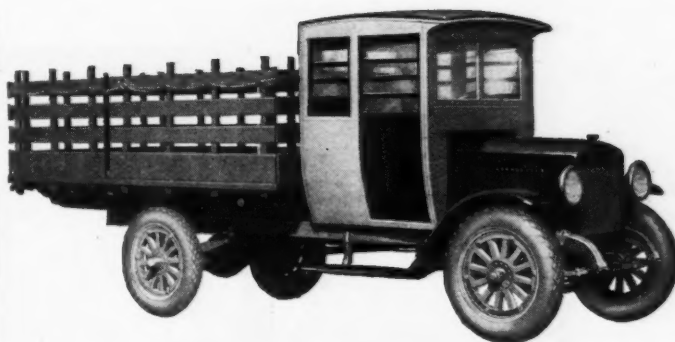
Each month you will receive new sales-gathering material—data that can be counted on to increase your monthly gasket sales, and boost your profits in proportion.

For your trouble in sending us your name and address, thereby helping us compile a roster of **Never-Leak** dealers, we will mail you one of our cylinder head gaskets **NO CHARGE**—any style or type you choose.

THE FITZGERALD MFG. CO.
Torrington, Conn.

NEVER-LEAK

Cylinder Head Gaskets



A Crackerjack One-Ton Model!

Today the one-ton truck is one of the country's best sellers. It's in demand everywhere.

Here's a crackerjack one tonner—a wonderful piece of merchandise.

This powerful, well-balanced, rugged one ton design will be a big money maker for money-making dealers.

Buda motor

Brown-Lipe clutch
and transmission

Timken axles

Modine-Spirex
radiator

132-inch wheel base

33x5 Pneumatic
cord truck tires

In production now. Prompt delivery. For big dealers and small dealers—for big towns or small towns—everybody everywhere can make money selling this remarkable one-ton job.

May we hear from you at once—today?

Duplex Truck Company
Lansing Michigan

DUPLEX

BUILT FOR BUSINESS

The
"Buffalo"
 Visor
 Model "B" is

A Quick
 Seller for
 Rapid Turnover

Motorists buy Buffalo Visors to really enjoy the scenery they have sought at great expense—to avoid eye strain—and to prevent accidents due to glare.

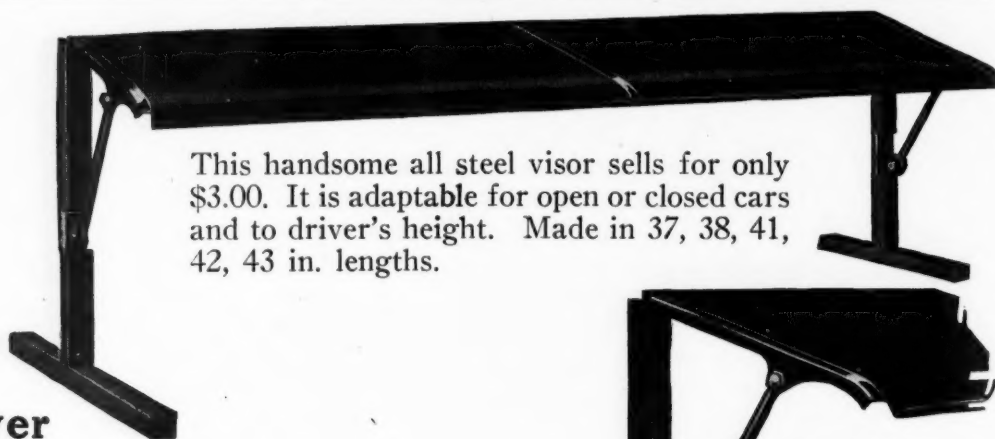
Dealers buy Buffalo Visors because of large profits, quick turnover, and freedom from all come backs or servicing—due to heavy steel construction which does not break, warp or rattle.

Buffalo Visors add to the appearance of any car, and the free display stand furnished dealers clearly shows this. Write NOW for details.

Buffalo Forge Company

184 Mortimer St.

Buffalo, N. Y.



This handsome all steel visor sells for only \$3.00. It is adaptable for open or closed cars and to driver's height. Made in 37, 38, 41, 42, 43 in. lengths.



Detail of bracket for closed cars with 3-hole adjustment for driver's height.

Simply slide clips on windshield posts of open car to adjust height. Tighten clamp and it can't slip.

CIRCLE "S"
 AUTOMATIC
 WINDSHIELD CLEANER



List Price

\$5.00

**These 8 Points
 Make Easy Sales**

No internal friction, uses every ounce of power—No pistons, rods or vanes—No packing to dry out—Pressure of squeegee against glass may be varied—Adjustable from inside the car—Can be operated by hand from the inside of car—Can be locked up out of way when not in use—Sells for only five dollars.

Dealers and Jobbers—Write us today for Sales Possibilities

F. W. STEWART MFG. CORP.
 356 W. Huron Street Chicago, Illinois

Manufacturers of the well known Circle "S" Swivel Joint.

**One of the Thirty
 Styles of GLOBE Boxes**



Type B-2296—22" Long, 9" Wide, 6 7/8" High.

It is long and shallow so that it can be mounted on the running-board of Ford cars. But it is deep enough to hold a pump, jack and other necessary tools. One of the most popular Boxes of our line.

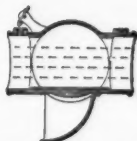
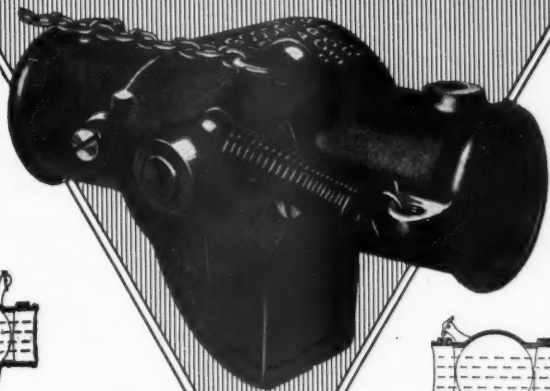
The Globe Machine & Stamping Co.
 Cleveland, Ohio

World's Largest Producer of Metal Tool
 and Battery Boxes, also Traffic Signals.

It's the Goodrich Design that Car Owners Like



CLOSED: the valve fits snug and close. Cannot fit otherwise. No rattles. No escaping gas to cause annoyance.



OPEN: the valve's heavy knife-like edge overcomes a great cut-out weakness. It shaves off all soot deposits inside the cut-out.

Goodrich MOTOR TESTING Valve

(Replacing Old Style Cut Out)

The Goodrich Motor Testing Valve is light in weight, accurately built, huskily made, snug fitting — and always ready.

It can't get out of order. It can't rattle or chatter. It never requires cleaning.

Instead of an ordinary butterfly type of valve, it has an exclusive patented *two-way revolving valve* that absolutely prevents carbon and soot from gathering.

On test, the bell shaped mouthpiece produces a clear, sharp staccato note that heralds the exact condition of the motor.

Goodrich Valves are sold in the small size for \$3.00. Complete with pedal, pulley and cable. Larger sizes in proportion. Get booklet giving proper sized valve to use on any car. Write your jobber—or direct.

Goodrich-Lenhart Mfg. Co.
Hamburg, Pa.

Repairmen and Motor Owners Unanimously for the HEALD

THE REPAIRMEN choose the Heald for its economy in producing the highest grade of work. The Heald Universal Jig permits quick set-ups and accurate location of the cylinder bloc regardless of size or type. Simplicity of control eliminates lost motion and accurately graduated dials supplant guesswork. Every factor for cutting time from floor to floor is incorporated in the design and the minutes saved on every bloc show in dollars in the day's profits.

THE CAR OWNER demands Heald regrinding because of its efficiency and economy. A Heald-ground cylinder is as perfect as mechanical means can make it. 90% of all motor manufacturers finish their cylinders by grinding and use Heald machines exclusively. Naturally the owners will want the same grade of finish when regrinding in order to maintain the high standard of their power plant.

If you are considering this work, visit several regrinding shops, get in touch with the manufacturers themselves, and finally question various motor owners as to what equipment they advise to handle this work so as to bring you ultimate success. Let us send you convincing literature or even give you a personal call. No obligation. Glad to do it.

The Heald
Machine Co.



61 New Bond St.
Worcester, Mass.

The Price and Profit are here

The Higgin All-Metal Visor brings satisfaction to the owner and profit to the dealer.

It appeals to all classes of motorists with its fine appearance and popular price. Suitable for the finest car.

The Higgin is made of 22 gauge cold rolled steel finished in hard enamel—black on outside—green inside. A turned up gutter at the bottom drains the water aside.

Staunch construction—efficient, perfect fitting brackets that stay put. Cannot rattle, flop, tear or crack. Made for all cars, including Fords.

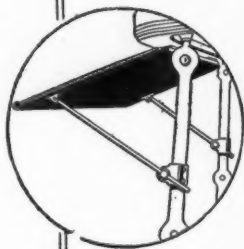
The Higgin selling plan is real merchandising assistance with protected territories. Write for it.

THE HIGGIN MFG. CO.
Automotive Division

Newport

Ky.

HIGGIN ALL-METAL VISOR



Sells big at

\$3.50

and nets a real profit.

Installed in twenty minutes. Easy and quick to adjust. Will not jar out of position.



Campbell Advertising Tire Covers

Campbell Advertising Tire Covers, will carry your sales message day after day at eye-level over miles of the city's principal streets and over country roads or where ever a car may be, creating invaluable publicity at a remarkably low cost.

The motorist is proud to use Campbell Covers, because they fit, and improve the appearance of his car.

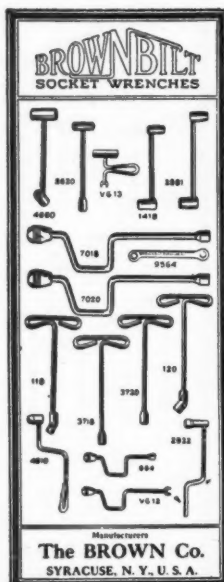
The trade-mark or slogan designs are dignified and in good taste. They do not create that undesirable "sign-board effect" but are proven evidences of the motorist's pride in his car or in its equipment.

The Perkins-Campbell Company,
622 Broadway, Cincinnati, Ohio

New York

Chicago

The Line That Pays



BROWN BILT Wrenches are backed by fourteen years of manufacturing experience. A wrench for every purpose. We illustrate this week our No. 300 Board (with eighteen sizes and types of wrenches). A silent salesman that brings results. One of these Boards in your show room is an ornament and a business getter. Your jobber can supply you. Ask by name — "BROWN-BILT." Catalogue on request.

THE BROWN CO.

100 Bellevue Ave., Syracuse, N. Y.

Representatives:

D. W. Van Keuren Co., 130 W. 42nd St., New York City
Schoen Bros., Boston Bldg., Louisville, Ky.
M. B. Berkman, 406 Carleton Bldg., St. Louis, Mo.
Sanborn & Putnam, 809 Call Bldg., San Francisco, Cal.

IT PAYS TO HAVE

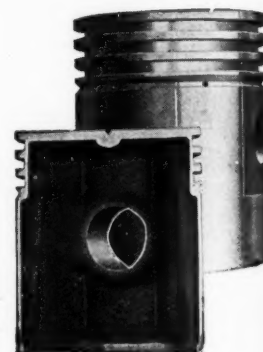
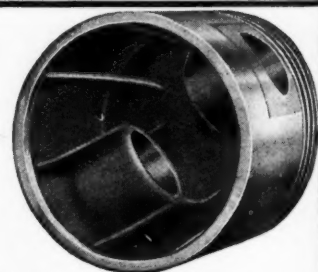
FOSTER

Sensible Lightweight

PISTONS IN STOCK

IT QUALIFIES THE SERVICE YOU CAN GIVE

Mr. Jobber, your trade confides in your ability to select the best. Strengthen this confidence with a stock of Foster pistons. Get in touch with us immediately.



FOSTER-JOHNSON REAMER CO.
1060 Beardsley Ave. **ELKHART, IND.**

DO YOU EVER TEST YOUR PUMP?

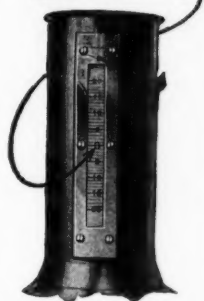
INSURE CORRECT MEASURE

With the New Dover Automatic Measuring Can



(Pat. May 10, 1921)

THE GAUGE IS CALIBRATED
IN CUBIC INCHES
THE ZERO IS THE UNIT
MEASURING POINT



Detail of Neck
and Gauge

Be sure your pump registers right. Under register means violation of and trouble with the law. Over measure means no profit.

Guessing cost 12 garagemen their business standing, for the sealer tied up their pumps after testing them with a *Dover Automatic Measuring Can*.

Put this good-will building sign on each pump—*Tested Daily with a Dover Automatic Measuring Can*.

**Dover Stamping & Mfg.
Co.**

385 Putnam Ave.
Cambridge 39, Mass., U. S. A.



Connecting Rods And Pistons

Can be quickly and accurately checked and assembled if you have an Eagle Aligning Fixture. You can detect the slightest twist or bend in the rod or a crooked hole in the piston.

WISE ATTACHMENT

This device is furnished with the Eagle Aligning Fixture. The Eagle is an unusually satisfactory tool—and this vise attachment makes it just that much more useful to you. If your repair shop uses an Eagle you know that every job is right. A properly aligned motor does not pump oil—and gasoline mileage is increased. Your customers will be pleased with the accuracy of your work. The Eagle is sold either as a Special or a Universal Fixture. It is an economical buy for repair shops and garages. It will pay you to write us for information.



Sold by your jobber
Eagle Machine Co.
24 N. Noble St.
Indianapolis, Ind.



Enthusiastic Dealers

the country over, tell us that the new

Robert Bosch Electric Horn

is the last word in Warning Signals.

Instant action—low current consumption—two distinct tones—long range.

Sells easily—stays sold—like Robert Bosch Magneto and Spark Plugs.

Send for details of the Robert Bosch Selling Franchise.

Robert Bosch Magneto Co., Inc.

OTTO HEINS, President

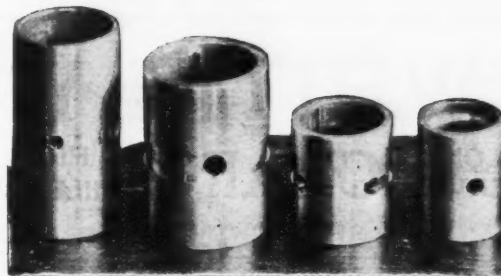
123 West 64th Street New York

Chicago Branch: 1302 South Wabash Avenue

Several Hundred U. S. Service Stations—

Representatives the World Over

The Genuine, Original Bosch means Robert Bosch only



Write for Stock List of

JOHNSON PISTON PIN BUSHINGS

Any size, any type, any quality shipped from stock.

Johnson Bronze Piston Pin Bushings are made of virgin metal, to S. A. E. specifications and under the direct supervision of a metallurgical engineer.

Write for our stock list of piston pin bushings for every make of car or ask your jobber's salesman.

JOHNSON BRONZE CO.
New Castle, Pa.

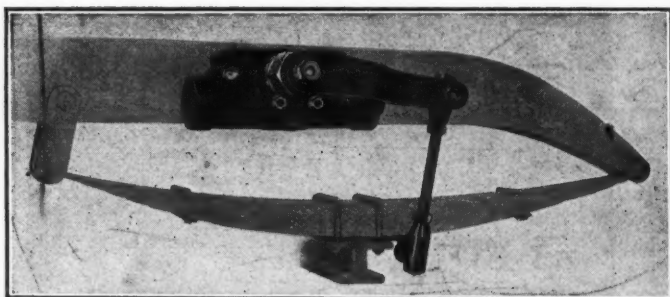
2-WAY Shock Absorber - Hydraulic

THE 2-Way shock absorber fluid-cushions all movements between the body and chassis. Something new in automobile spring control. Once used, owner finds indispensable.

Distributors Wanted

AUTO SPRING CONTROL COMPANY

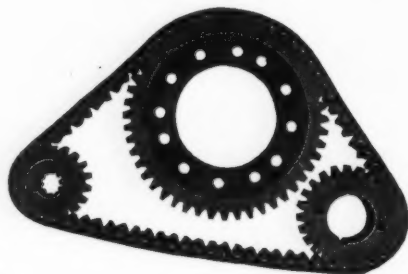
Jamestown, N. Y.



"WHITNEY"

LONG SERVICE CHAINS HIGH MILEAGE
SILENT TYPE

Never Skip the Sprocket Teeth



Unrivalled for Great Mileage

THE WHITNEY MFG. CO.
HARTFORD, CONN.

New York Boston Philadelphia
L. C. Biglow & Co., Inc. George C. Steil, R. J. Howison
232 West 55th Street 200 Devonshire Street. 1361 Ridge Ave.
San Francisco, A. H. Coates Co., 770 Mission St.

ELEGANT!

IS THE WORD THAT DESCRIBES THE

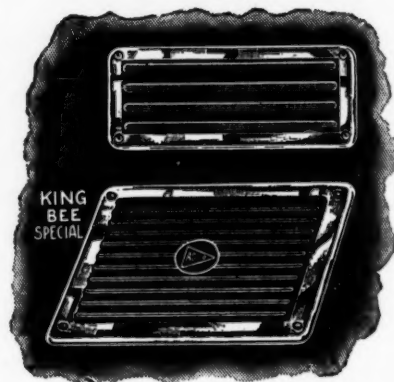
**KING BEE
SPECIAL**

These plates will add to the appearance of any car because they are made of hard aluminum (not soft castings) and therefore will hold a beautiful mirror finish.

Both the plate and the kick possess rubber mat inserts of non-blooming live rubber extending above the frames and forming a drain preventing the accumulation of water and slush.

A handsome display easel with every dozen sets.

Dealers: Ask your jobber for prices, or write us if you have any difficulty.

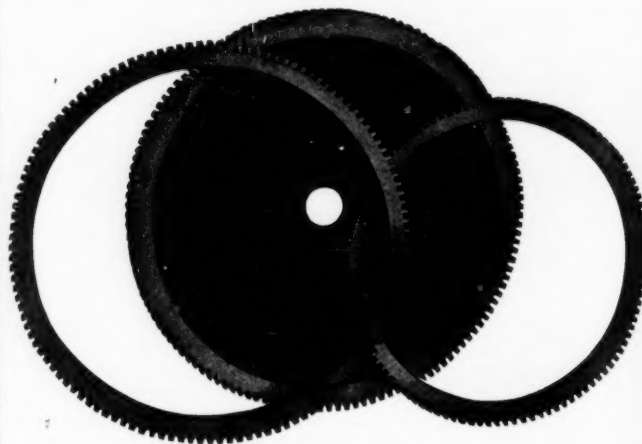


RETAILS AT \$2.50 COMPLETE

This includes plate, kick with both rubber mat inserts and necessary screws for attaching.

Manufactured by

**AMERICAN
AUTOMATIC DEVICES CO.**
502 So. Throop St., Chicago



Get Meachem Prices on Fly Wheel Rings

Quantity production of highest quality fly wheel ring gears enables us to quote surprisingly low prices. Write for price list. Ten thousand in stock for immediate delivery.

THE MEACHEM GEAR CORP'N
Syracuse, N. Y.

The Ultimate Way WET INTERNAL GRINDING

Wet grinding, as made possible by the Micro Internal Grinder is as far in advance of ordinary dry grinding as the present day automobile is over the old ox team.

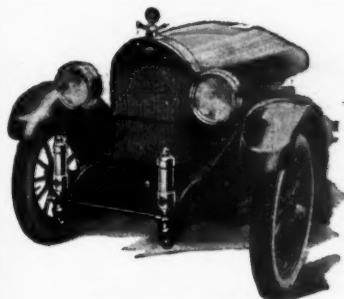
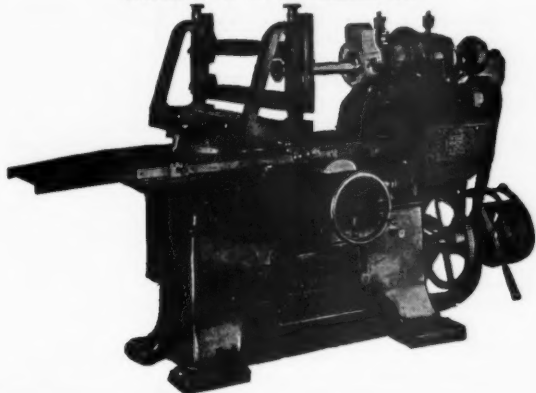
Micro

The Micro is a highly developed type of internal grinder adaptable for either wet or dry grinding, at the option of the operator, permitting highest quality of results. Its automatic action, both as to cut, feed and table travel provides the most accurate work humanly possible in exceptionally quick time.

If you're going to get a grinder, get the kind that will pay you biggest returns. Our bulletin gives full information—send for it.

MICRO MACHINE COMPANY, Bettendorf, Iowa

Successor to B. L. Schmidt Co.



FOR THE FRONT

Model A for cars up
to 3500 lbs.
\$150

Easily Installed

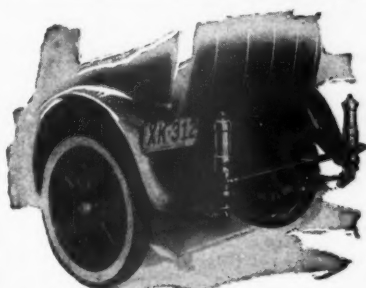
Simply remove horn
from end of car frame
and insert the Air
Spring attachment.
Three new rivets to set.
Attached to spring by
removing Shackle bolt
and then replacing.

REID AIR SPRINGS
FLOAT THE CAR ON AIR

Cars equipped with
Reid Air Springs are
permanently re-
lieved from road
jolts. The posi-
tive two-piston
action cushions
the bumps
against Air
pressure and Oil
without causing
instability.

Attractive profits
for live dealers and
distributors. Get
full details now.

The Reid Air Spring Co.
New Haven, Conn.



FOR THE REAR

94 cylinders resized in one week with Auto-Hone

A garage man in Kansas City did this. Sixteen jobs—ninety-four cylinders—on all classes of cars from Fords to Packards. He did this at a big profit with a single pair of Auto-Hones. He collected enough the first week to MORE than pay for his Auto-Hone.

You can do the same

Auto-Hones are made in two sizes:

For cylinder 2 13/16 to 3 3/8
bore \$85.00

For cylinder 3 3/8 to 4 1/2
bore 95.00

A complete illustrated direction sheet accompanies each tool which enables you to do perfect work right from the start. Don't overlook this opportunity. Send your order in or write for information today.

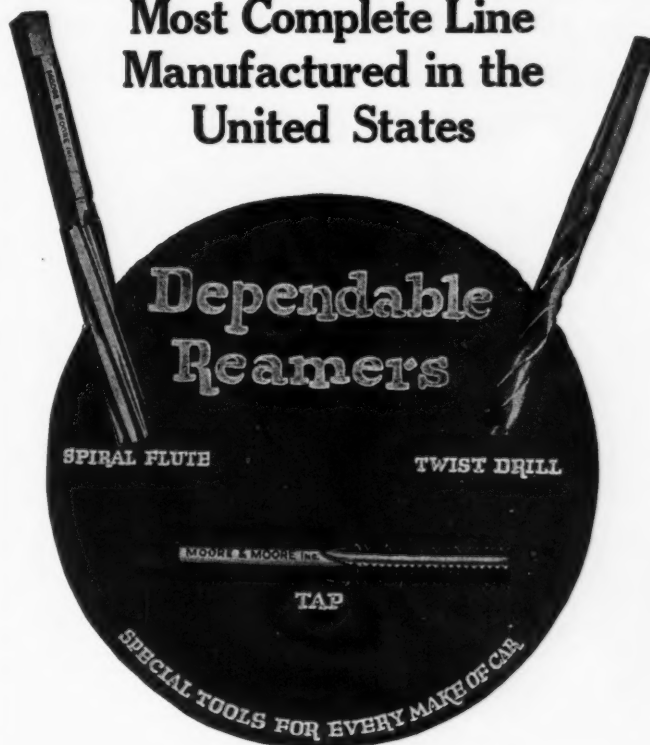


Slip Auto-Hone into cylinder—connect its steel driving handle to your electric drill—turn on the power—and the work is started.

It is a grinder, reamer, boring and lap machine (all in one). Pressure on the stones is regulated from the driving end of the tool. As the stones are forced out radially, the AUTO-HONE centers itself. No expert help needed.

CYLINDER
THE AUTO-HONE CO.
GENERAL OFFICES 1587 MAIN STREET
BUFFALO, N.Y., U.S.A.

Most Complete Line Manufactured in the United States



SPIRAL FLUTE

TWIST DRILL

TAP

SPECIAL TOOLS FOR EVERY MAKE OF CAR

Moore & Moore, Inc.
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E-C-L Pistons

ALUMINUM ALLOY NON EXPANDING



How to Eliminate Piston Slap
Piston Slap is a common and vexatious cause of engine trouble which in the past has bothered most car owners. But it can now be eliminated. With the E. C. L. Aluminum Alloy Non-Expanding Piston. E. C. L. Pistons may be fitted with a closer degree of clearance than cast iron pistons. They reduce the consumption of gas and oil — increase power and speed and eliminate spark knocks. Let us tell you more about this remarkable piston. Write for the details today.

E. C. LONG

Main Office and Factory

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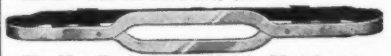
Detroit, Mich.

Guaranteed Unconditionally

New Era
Bumper
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New Duo-Convex Bumper with back bar reinforcement. Double convex spring bars with graceful stream lines. Black or full nickel. \$17 to \$24, according to size and finish. Without back bar, \$14.



The New Duplex Sport Model. Most beautiful bumper on the market. Black japan or nickel. Medium cars, black, \$16.50, nickel \$18.50. Large cars, full nickel only, \$26.

Fit All Cars
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Twenty Styles
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Export Dept. 130 West 42nd St., New York City

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Learn the interesting details from our descriptive data.

—accounts for every labor minute

Prints the year, month, day, hour, minute, A. M. or P. M. at the exact moment the plunger is pressed—like this, for example:

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Tells when a job is started—and when it is finished. There can be no dispute over the time charge.

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are a quality product sold to dealers at attractive discounts.

The use of our gears greatly increases your profit on repair work.

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Cloyes Gears are unaffected by oil or moisture and may be operated in an oil bath without shrinking or swelling.

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Electric Drill and Valve Grinder

That saves every garage or repair shop time and money.

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Louisville, Ky., U. S. A.

C. E. Willey, Pres. J. B. McFerran, Secy-Treas.

It will do the work.



Steady High PERFORMANCE

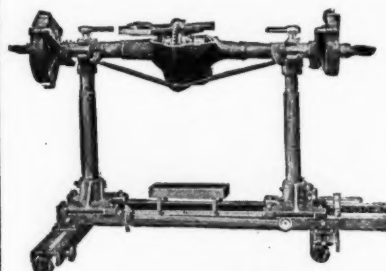
is a certainty with the new Waukesha Bus and Truck Motor. Operating costs are a revelation in motor economy.

Write for complete details.

The Waukesha Motor Company
Waukesha, Wisconsin

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MANLEY UNIVERSAL AXLE STAND



The Stand is adjustable to all types of axles, front or rear, split or solid. The offset clamping jaws are so constructed that they firmly hold any axle and provide clearance for the truss rods. The adjustable outboard support is an important feature, and is a necessity in assembling split axles.

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You can convert the Manley Axle Stand into the Standard Manley Engine Stand in three minutes. This dual purpose feature is a tremendous improvement.

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BLACK & DECKER

SPECIAL
HALF-INCH
DRILL

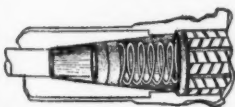
"With the Pistol Grip
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\$68.00

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STOP THAT GREASE LEAK KEEP THE BRAKE BANDS CLEAN



Every Ford and 490 Chevrolet should install the R. & R. Automatic Grease Retainer, the only Grease Retainer with automatic take-up. Easily installed and requires No Special Tools.

PRICED—\$1.00 per wheel—\$2.00 Per Set

DEALERS—Write for our proposition.

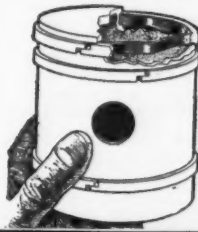
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READ THE CLASSIFIED ADS IN MOTOR AGE



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GENUINE
APEX INNERINGS
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installed, one under each piston ring do the trick. No matter what the job, pleasure car, truck, tractor, light plant, marine or stationary engine—results are guaranteed when installed according to instructions. It is unnecessary to rebore; Innerings centralize pistons and cause perfect ring face alignment. Millions are in use—hundreds of thousands of car owners, dealers and garage men all enthusiastically endorse them. Talk to your dealer today. Order like piston rings. Retail Price, 30c ea. up 3/8" wide or 5" diam. Larger 50c.

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JOBBER: Write today for list of present connections and profitable information.

THOMSON-FRIEDLOB MFG. CO.

Peoria

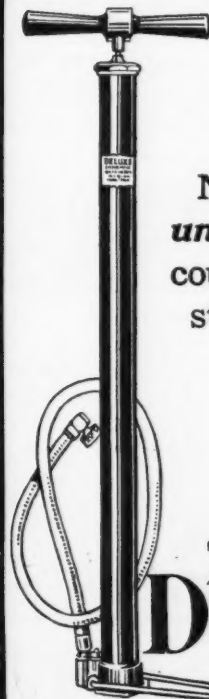
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Illinois



Insist that your purchase bears our guarantee Tag. It is your protection against fraudulent imitations.

DELUXE
Products
for the Motorist's Comfort



None but a very
un-ordinary pump
could carry such a
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ORDER DIRECT
SPECIFYING
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The
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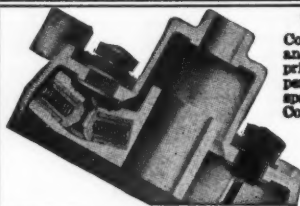
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INDIANAPOLIS PUMP & TUBE CO.
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INTERNATIONAL MOTOR TRUCKS *for low-cost hauling*

Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.

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Combines the "wipe" and "roll" contact principles. Gives full, perfectly synchronized spark at all speeds. Contacts are positive and unfailing. A wonderful dealer proposition. Write E. D. Hedge Tool & Mfg. Co., Watertown, N. Y.

Twin Timer
FOR FORD CARS TRUCKS & TRACTORS

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Won't Leak Because They're Sealed With Oil



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It will pay you to stock No-Leak-O at once.

Price 50c and up.

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Electrical Testing Equipment

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TIRES AND TUBES

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Kokomo Long Life tires and tubes make money for dealers who handle them.

Kokomo Twin-Grip Fabrics

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BELTING and HOSE COMPANY

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The Correct Measure Motor Oil Display Pump will increase your oil business. Handsome. Compels attention. Delivers 1/2 gallon in 12 seconds. Can be put on curb in morning—and back indoors at night. \$45 per unit. Write for details concerning this money maker.

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MOTOR OIL DISPLAY PUMP

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Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

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You Sell

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The Spencer Mfg. Co.,
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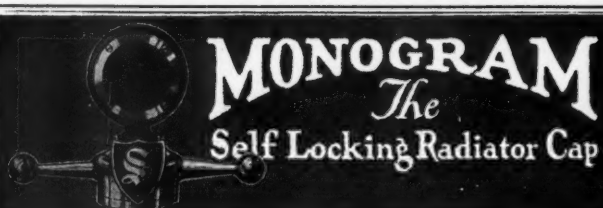
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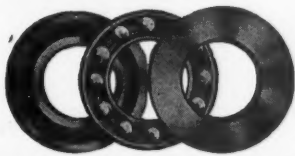
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For over sixty makes of cars and trucks in general use today, Walden-Worcester has Service Selections of Socket Wrenches—each selection especially adapted for particular parts of the particular car for which it is designed.

Your Jobber can supply you with any or all Selections from his stock. Write him.

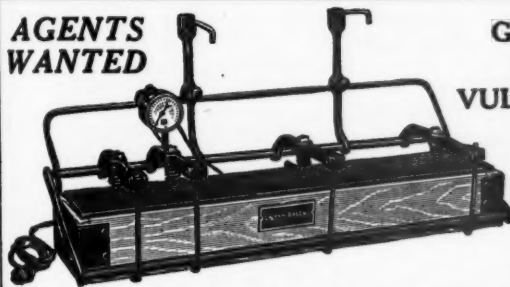
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Incorporated

General Offices and Factory

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Steam Pressure, Electrically Heated, Automatic Control, Fire Proof, Efficient and Economical

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Successors to Gwynn-Bacon Vulcanizer Co.

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Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.

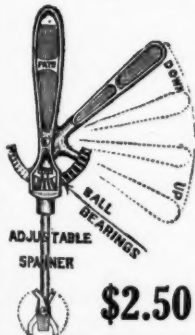


FOR 33 YEARS THE STANDARD
IF IT'S **PARANITE** IT'S RIGHT
Quality jobbers handle quality cable—that's **PARANITE**.

Indiana Rubber & Insulated Wire Co.

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Simple, sturdy, fast working. With its oscillating motion always under control.

A tool you can depend on to turn out a good job.

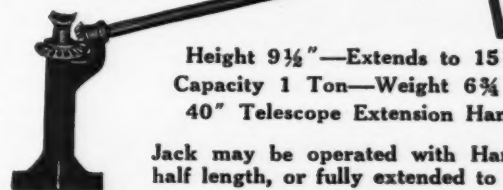
Ask your jobber or write

Universal Equipment & Supply Co.
Syracuse, N. Y.

\$2.50

The SPRINGFIELD JACK No. 1

[Ball Bearing]



Height 9½"—Extends to 15½"
Capacity 1 Ton—Weight 6¾ lbs.
40" Telescope Extension Handle

Jack may be operated with Handle at half length, or fully extended to 40".

View Showing
Handle Half
Length 20"

Manufactured by

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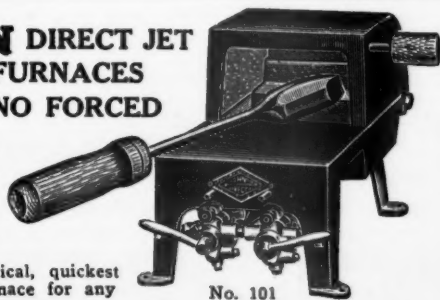
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For Soldering and Heat Treating

The most economical, quickest heating Bench Furnace for any shop.

Fitted with two Powerful Johnson Burners, which produce a heat of 2000° F. in the fire-box instantly.

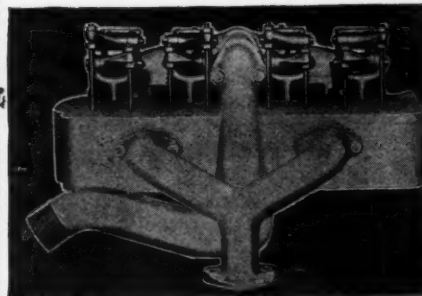
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No. 101

JOHNSON GAS APPLIANCE CO.
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Stupendous Power—Lightning Speed

Ford racing cars with Roof Equipment are rivals on mile and one half mile tracks of the highest priced racing cars. Doubles the pulling power of the Ford or Dodge pleasure car or truck. Hill climbing and general road work beyond wildest dreams of the owner. Complete—ready for installation—no machine work necessary. We are headquarters for all speed equipment. No matter what you want, write us. Racing quality—lowest prices. A postal card brings you complete list of our specialties.

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FOLBERTH
Automatic
WINDSHIELD CLEANER

Pat. "It Cleans While You Drive"


A good profit for you in this wonderful, fast-selling necessity. Ask your jobber or write.

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CLUTCHES, TRANSMISSIONS, CONTROLS, DIFFERENTIALS




WAYNE
VALVE-FACER

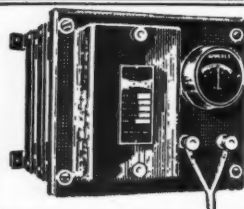
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\$20

Seven body types—\$1395—\$2385

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Finer Motor Cars  *At Lower Prices*



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But Be Sure It's **WRIGHT**



STUTZ SIX
America's Lowest-Priced Quality Six
STUTZ Speedway Four
America's Pre-eminent Sport Car

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Builders of the Original and Genuine Stutz Cars



Sioux
Garage Tools make well equipped shops. Ask your jobber.

Fast and ACCURATE for re-facing, reseating and grinding all size valves.

Sioux Flexible Shaft and Attachments take the tool to the work.

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With the Wandering Oil Groove

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WICACO

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ALL THE NAME IMPLIES
PISTON PINS

Automotive Division
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THE NEW EMPIRE DISTRIBUTION PLAN enables dealers to make extra profits on these well known super-standard casings and tubes.

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Rello, an electric-drive wet grinder for pistons, pins, valves, bushings, \$475.00.
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Van Norman Machine Tool Co.
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The COURIER Six

Nine body types,
from \$1,195 to \$2,165

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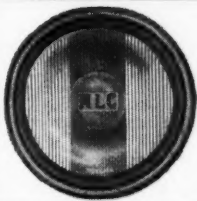
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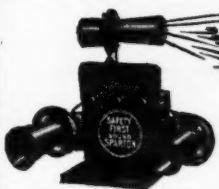


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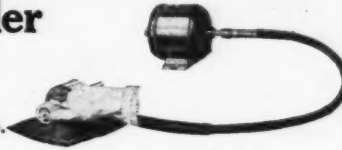
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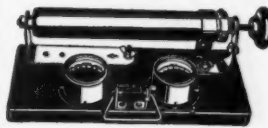
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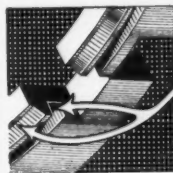
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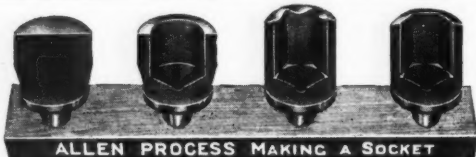
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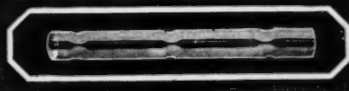
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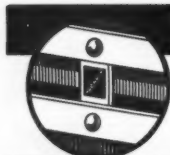


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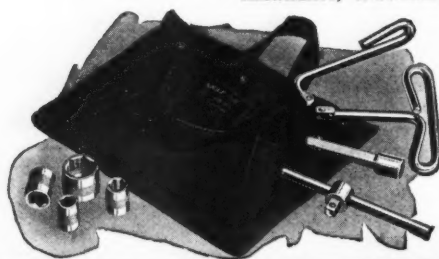
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Child or Stepchild? An Analogy

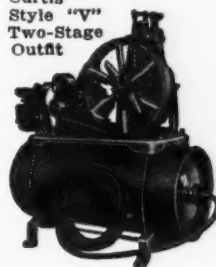
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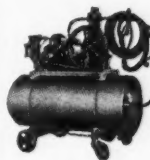
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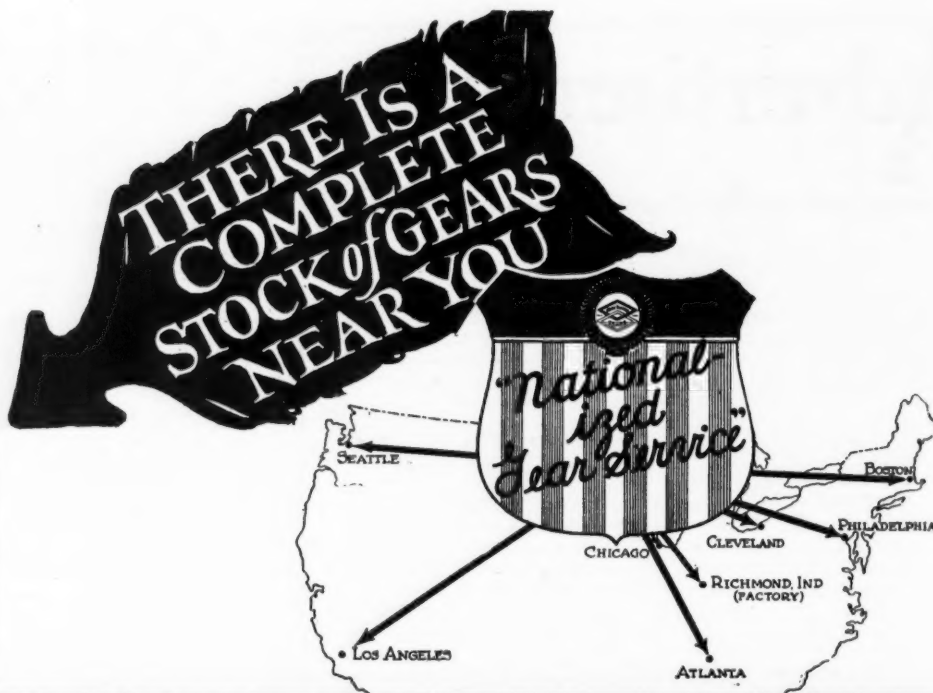
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